



**State of Good Repair (SGR) Funding Program  
Locality-Owned Bridges  
Requirements for applications for the update to the FY2023-FY2028 SYIP**

August 12, 2021

**C. Todd Springer, M.Sc., P.E.**

Program Manager, Bridge Maintenance/Management Program Area  
Structure and Bridge Division

# State of Good Repair (SGR) Locality-Owned Bridge Program

## AGENDA

- Code of Virginia (with respect to SGR)
- Various Funding Programs
- Structure Eligibility
- Scope Eligibility
- Project Scoring
- FY23-FY28
  - Schedule
  - Full and Pre-Applications
- Pre-Scoping
- Special Scope Topics
- Budget Increases
- SMART Portal



# BACKGROUND

Much of this information can be found at below

[MAIN SGR WEBPAGE](#)

[SGR BRIDGE WEBPAGE](#)

[About](#) | [Jobs](#) | [Contact](#) | [Maps](#) | [511](#) | [SMART SCALE Dashboard](#)

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Quick Links

- SGR Bridge Program
- SGR Primary Extension (Locality) Pavement Program
- SMART Portal
- Important Dates

State of Good Repair (SGR) Program

In 2015, [House Bill 1887](#) was passed and incorporated into the [Code of Virginia \(§ 33.2-369\)](#) to create the State of Good Repair (SGR) Program. Also, [Code of Virginia \(§ 33.2-232\)](#) and [Code of Virginia \(§ 33.2-214\)](#) have requirements regarding the SGR program

Known as State of Good Repair (SGR), the program provides funding for deteriorated pavements and Poor Condition -- *structurally deficient* \* (SD) -- bridges owned or maintained by the Virginia Department of Transportation (VDOT) and or localities, as approved by the Commonwealth Transportation Board (CTB). Legislation requires the program to be transparent and based on objectively obtained and developed data.

House Bill 1887 (Chapter 684) Enactment 2 required that the [Commonwealth Transportation Board \(CTB\)](#) approve a prioritization ranking process by July 1, 2016 for SD bridges and deteriorated pavements. CTB approved the SGR Program Prioritization Process Methodology in June 2016 as outlined in "[Resolution of the CTB Approved Process Methodology and FY2017 State of Good Repair Percentage Fund Distribution](#)". Subsequent Resolutions have since been approved by the CTB to address fund distributions and other matters affecting SGR. Links to the various CTB resolutions can be found below.

SGR allocations are for rehabilitating or replacing bridges deemed in Poor Condition (SD) on the [National Bridge Inventory](#) (NBI) and deteriorated pavement on interstate and primary highways. SGR funds are required to be distributed proportionately between VDOT and localities, based on assessed needs. Each district will receive between 5.5 percent and 17.5 percent of the total available SGR funds in any given year based on its SGR needs as described above. Furthermore, the CTB has the ability to approve two exceptions or waivers to this funding distribution requirement.

State of Good Repair Requirements

Description	Pavement	Bridge
Purpose	Reconstruction/Rehabilitation (Deteriorated)	Reconstruction/Replacement (Structurally Deficient)
System	VDOT Maintained Interstate and Primary Routes and Locally Maintained Primary Extensions	All Systems (VDOT and Locally Maintained)
Priority Consideration	Priority Consideration Lowest CCI, Highest AADT Number, Condition, Costs	Number, Condition, Costs
Distribution	All nine construction districts - Based on needs Min 5.5% and Max 17.5% per year	
Waivers	Key Project - extraordinary circumstances only - cap can be waived	
	20% taken off the top for Secondary Pavements (if VDOT secondary target not met)	N/A

\* A bridge that has been deemed structurally deficient does not imply that it's likely to collapse or is unsafe, but there are elements of the bridge that need to be monitored and / or repaired.

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Quick Links

- SGR Primary Extension (Locality) Pavement Program
- SMART Portal
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SGR Bridge Program

State of Good Repair (SGR)

The State of Good Repair (SGR) provides funding for deteriorated NBI bridges in Poor Condition or otherwise known as structurally deficient (SD) for that bridges that are owned by the Virginia Department of Transportation (VDOT) and or localities. SGR provides funding to complete long-term solutions exceeding routine maintenance, but it should not be viewed solely as a bridge replacement program. The scope of bridge work paid for under the SGR program should be adjusted appropriately to meet the needs of each particular bridge, with consideration for the overall limitations on funds available to address the bridge inventory.

In general, project scopes should be established to rehabilitate, reconstruct, or replace deficient elements in the most practical and cost-effective manner and must also include measures (materials, technologies or details) to mitigate future deterioration. Bridge replacement projects are generally expected to be "in-kind" replacements. SGR funds are not intended to pay for increases of traffic capacity of a bridge or roadway.

Additional information can be found below.

SGR Project Scoring and Scope Eligibility

SGR Bridge Application Submittal Requirements Summary

Draft SGR Prioritization Scores for Eligible Structures

Current Eligible Structures

Previous SGR Bridge Project Selections

Bridge Budget Increase Request on an Existing SGR Project

## State of Good Repair Bills, Code of Virginia

- House Bill 1887 in the 2015 Session & Code of Virginia § 33.2-369. State of good repair
  - Federal (and state funds although state funds are not required on any given project)
  - All projects developer per federal requirements
- **Key Excerpts**
  - As used in this section, "state of good repair purposes" means improvement of deficient pavement conditions and improvement of structurally deficient bridges.
  - The Board shall use funds allocated in § 33.2-358 and § 58.1-1741 to state of good repair purposes for reconstruction and replacement of structurally deficient state and locally owned bridges and reconstruction and rehabilitation of pavement on the Interstate System and primary state highway system determined to be deteriorated by the Board, including municipality-maintained primary extensions.
- **Take Away**
  - SGR reconstruction/replacement bridge projects are capital improvement projects in a construction (and SYIP) program for the preservation program for bridges in poor (SD) condition.
  - SGR is not a capacity expansion or safety improvement program, and is not structured to evaluate the cost benefit of those improvements for these types of projects.
  - Secure non-SGR funding early on (in planning and prior to pre-scoping) for those non-SGR scope items

# Virginia Highway Funding Programs / Sources



































<https://smartportal.virginiahb2.org/#/>

<http://www.virginiadot.org/VDOT-Funding-Sources.pdf>

Explore other funding sources for non-SGR scope during planning and pre-scoping

1. SMART SCALE
2. State Maintenance & Operations (VDOT)
3. Special Structures (VDOT) (under development)
4. Interstate Enhancement & Operations (Corridor Plan) (VDOT)
5. Highway Safety Improvement (various)
6. Transportation Alternatives
7. Locality Maintenance Payments
8. Revenue Sharing (Locality)
9. Access Programs
10. Regional Authorities
  1. NVTA / HRTAC / CVTA
11. HOT / Tolls / P3 / Private
12. Locality Project Contributions
13. Other funds

<https://www.tollroadsinvirginia.com/Home/TollFacilities/>

Northern Virginia	Richmond	Hampton Roads
495 Express Lanes (Interstate 495/Capital Beltway) 	Pocahontas 895 (Rt 895)  	64 Express Lanes 
66 Express Lanes (Inside the Beltway) 	Powhite Parkway Extension (Rt 76)  	Chesapeake Bay Bridge Tunnel (Rt 13)   
95 Express Lanes 	RMTA Expressway System (Boulevard Bridge, Downtown Expressway, Powhite Parkway)  	Chesapeake Expressway (Rt 168)  
395 Express Lanes 		Dominion Boulevard (US 17)  
Dulles Greenway (Rt 267)   		Elizabeth River Tunnels (Downtown Tunnel and Midtown Tunnel)  
Dulles Toll Road (Rt 267)  		George P. Coleman Bridge (Rt 17)  
		South Norfolk Jordan Bridge  
Payment Type Legend:  E-ZPass  Automated (Exact Change Only)  Credit Card  Bill by Mail (Pay by Plate)  Cash (Toll Collector)		
<small>*Limited times and locations. Check toll facility's website.</small>		

## State of Good Repair Bills, Code of Virginia

- **Key excerpt from Code of Virginia § 33.2-369. State of good repair**
  - **The Board shall allocate these funds to projects in all nine highway construction districts for state of good repair purposes based on a priority ranking system that takes into consideration**
    - (i) the number, condition, and costs of structurally deficient bridges and
    - (ii) the mileage, condition, and costs to replace deteriorated pavements.
  - **The Board shall ensure an equitable needs-based distribution of funding among the highway construction districts, with no district receiving more than 17.5 percent or less than 5.5 percent of the total funding allocated in any given year.**



# Distribution of SGR Funds Per Latest Commonwealth Transportation Board Resolution

## Attachment A

FY 2022 State of Good Repair Percentage Fund Distribution Chart

2022 Percentage Fund Distribution Updates*					
District	Proposed 2022 Update	VDOT		Locality	
		Pavement	Bridge	Pavement	Bridge
Bristol	12.76%	14%	63%	2%	21%
Salem	11.00%	19%	65%	4%	11%
Lynchburg	6.28%	18%	70%	4%	7%
Richmond	17.50%	10%	78%	3%	9%
Hampton Roads	17.50%	5%	40%	18%	37%
Fredericksburg	11.95%	8%	88%	1%	3%
Culpeper	6.28%	15%	47%	2%	36%
Staunton	10.45%	28%	66%	3%	3%
Northern Virginia	6.28%	23%	71%	4%	1%

\*Numbers may not add to 100% due to rounding.



# State of Good Repair Bridge Program

## Project Selection and Eligible Work Items Structure Eligibility

**Bridges that are eligible for SGR funding shall meet the requirements in**  
**IIM-S&B-95: State of Good Repair Bridge Project Selection and Eligible Work Items**

- ***“VDOT & Locality Owned bridges***
- ***The bridge must meet the definition of an NBI bridge. NBI bridges include bridges and culverts.***
- ***The bridge must be in poor (SD) condition as of the annual program update. \****

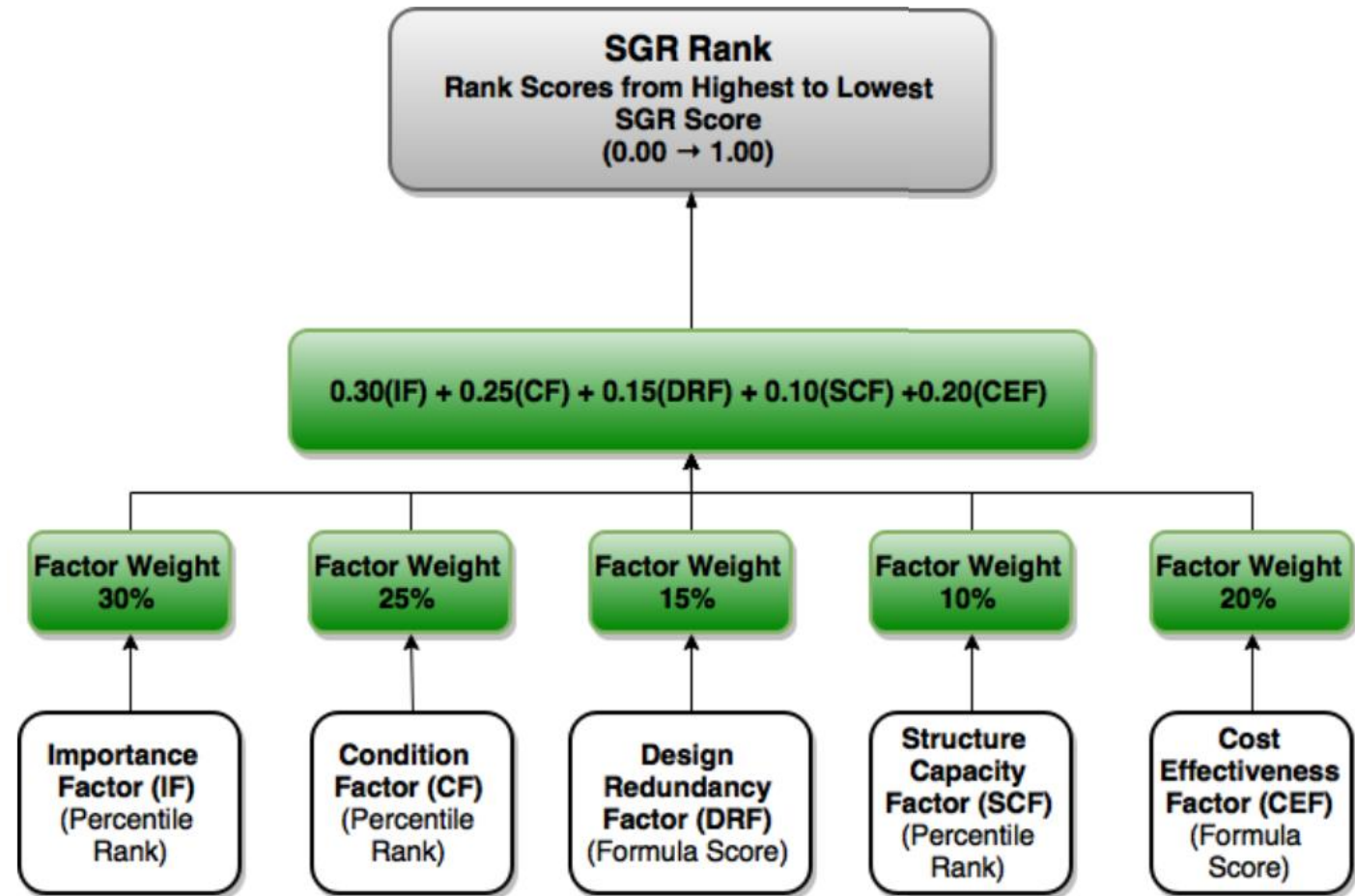
***\* In very limited cases a bridge that is not in poor (SD) condition as of the annual program update may still be eligible for funding if:***

- *It had been in poor (SD) condition within the prior 24 months of the annual program update and was replaced with an urgently required temporary bridge. After 24 months a temporary bridge installed to eliminate the poor (SD) condition status will be considered permanent.*
- *The “annual program update” is the date when the inventory and condition data for all poor (SD) NBI bridges is updated. The data, as of this date, are used in the prioritization formula. The annual program update is currently July 1st of each year.”*

**Current Round: Bridges in Poor (SD) condition category in BrM (VDOT) on July 1, 2021 are used for the update to the FY2023-FY2028 SYIP.**

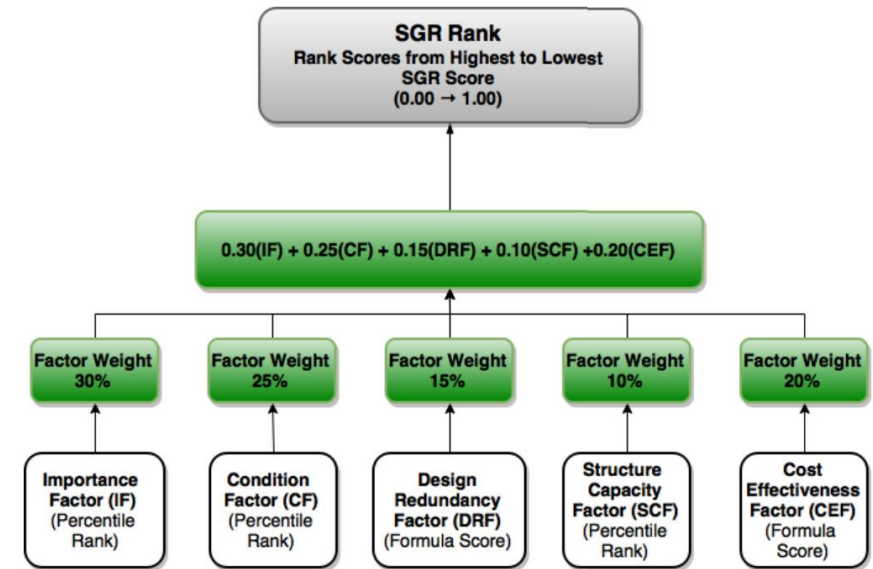
# VDOT Structure and Bridge Division Bridge Prioritization Formula

VDOT Structure and Bridge Division  
Virginia Bridge Prioritization Formula  
including the use of Smart flags



## VDOT Structure and Bridge Division Bridge Prioritization Formula (used for SGR)

- **Five Sub Factors (0.00-1.00 scale, Max score = 1.00, Min Score = 0.00)**
  - Importance Factor (IF) (e.g. user importance)
  - Condition Factor (CF)
  - Design Redundancy Factor (DRF) (e.g. risk)
  - Structure Capacity Factor (SCF) (e.g. functionality)
  - Cost Effectiveness Factor (CEF)
- **Sub Factor weighting**
  - Each factor has a weighting
  - Weighting of factors total to 100%



\*\*\* backup slides at end if there are questions \*\*\*

You are encouraged to review the details of the [Virginia Structure Prioritization formula!](#)

## State of Good Repair Bridge Program Project Priority Scoring (used for SGR)

- **VDOT provides initial scores using BMS level scope & estimates (pre-conceptual level ~ ball park)**
  - **SGR repair scope**
  - **SGR bridge replacement**
- **Applicant completes pre-scoping, and provides below for final scoring**
  - **Alternative analysis for SGR repair scope**
    - Bridge or culvert replacement
    - Bridge Rehabilitation – Superstructure Replacement
    - Bridge Rehabilitation – Deck Replacement
    - Bridge Rehabilitation – Minor
    - (Large) Culvert Rehabilitation
  - **Cost Effectiveness Factor (using estimates for below)**
    - SGR fund request (usually equals SGR repair estimate)
    - SGR bridge replacement estimate
  - **Smart Flags (modify the scores for the CF, IF, DRF, SCF, CEF)**
    - Identify site specific issues not reflected in the BrM data
    - Provide the required documentation

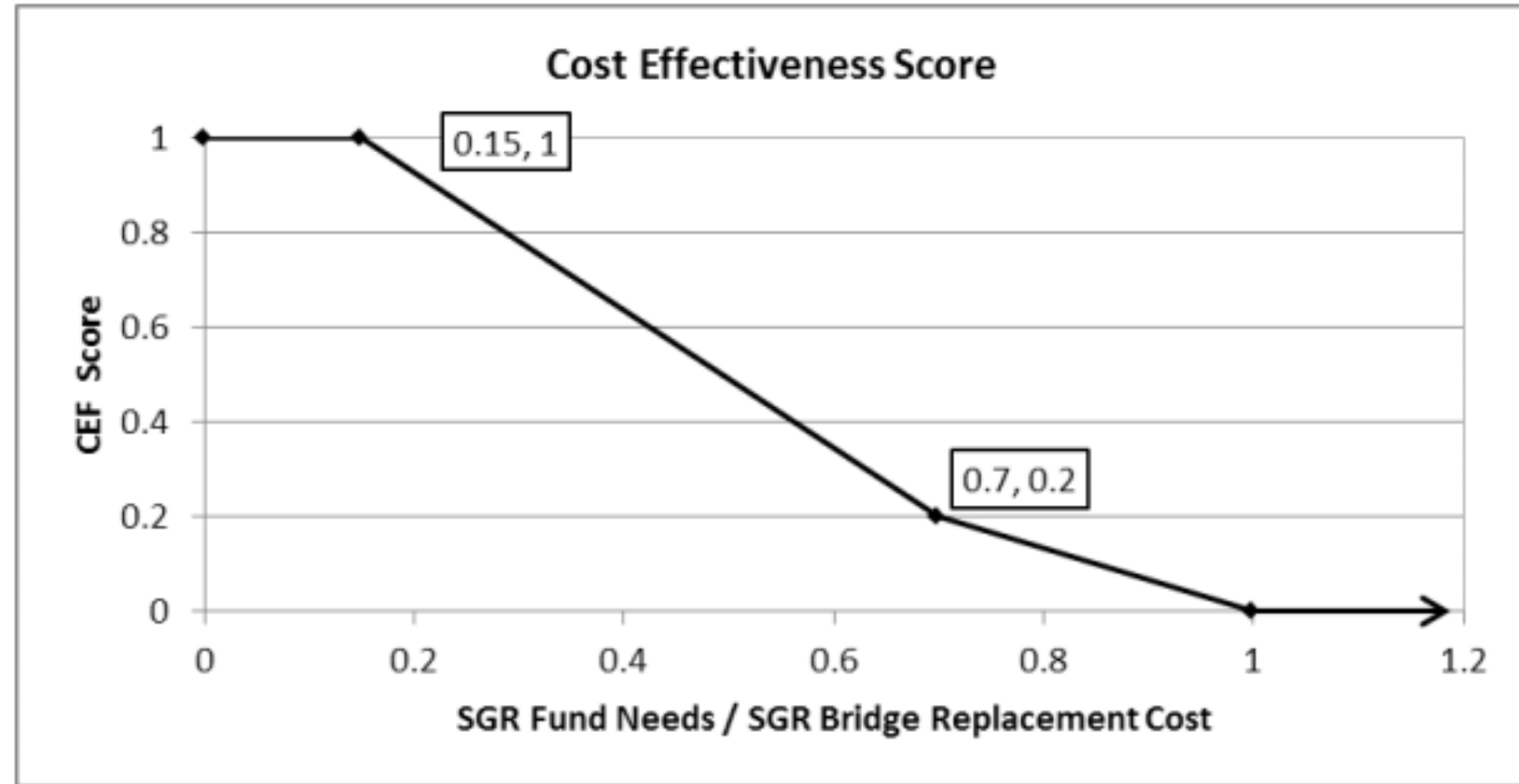
## State of Good Repair Bridge Program Project Priority Scoring – Cost Effectiveness Factor

Figure 11 – Cost-Effectiveness Score

- **Pre-Scoping**
  - SGR repair scope
  - SGR repair estimate
  - SGR bridge replacement estimate

SGR fund need =  
SGR repair estimate less  
other non-SGR funds  
that cover SGR scope

Usually  
SGR fund need =  
SGR scope estimate



# State of Good Repair Bridge Program

## Project Priority Scoring – Smart Flags (1 of 2)

Summary of Override Exceptions for SGR Bridge Factor Scores (July 1, 2018)				
Smart Flag Code	Applicable Factor	Short Description (SMART Portal)	Description of Smart Flag	Required Supporting Documentation (DBE must place supporting documents in the bridge file at the district office, note SGR program can be audited)
IF-1 (Obsolete)	Importance	The intention is to abandon the structure.	If a district intends on abandoning the bridge and ultimately removing the bridge from the S&B inventory, then the DBE may request that bridge be given an IF of 0.00.	1) Documentation indicating desire to close the bridge. 2) Ideally, a schedule indicating how and when the bridge will be abandoned, and when the bridge will be removed from the S&B inventory.
IF-2	Importance	Bridge is the only access to a community, hospital, school, military base, police station, fire station, or critical government facility.	The IF can be set to 1.00 if requested and the supporting document shows the following: - If a bridge is on a route that provides the only access (ie. no detour or alternative route) to a community, hospital, school, military base, police station, or critical government facility, or would hinder adequate emergency service access. A community may include a small number of houses or subdivision.	1) Map showing the location of the bridge, facility in questions, and surrounding area and the sole access route and that no detours exist.
IF-3	Importance	For Bridges with ADT < 100 and an acceptable detour exists, the DBE can request the Importance Factor be set to 0.	The IF can be set to 0.00 if requested and the supporting document shows the following: - The Bridge has an ADT < 100 and an acceptable detour exists.	1) ADT < 100 per BrM database, ADT from published information from the Traffic Engineering Division, or updated traffic counts. 2) Map showing an acceptable detour exists.
DRF-1	Design Redundancy	A fracture critical structure in which a fracture critical element is in Poor condition.	The DRF can be set to 1.00 if requested and the supporting document shows the following: - The Bridge has a Fracture Critical element that is in Poor Condition.  For FC, see <a href="https://www.fhwa.dot.gov/bridge/120620.cfm">https://www.fhwa.dot.gov/bridge/120620.cfm</a> ; and Fed Item 92A	1) Inspection Report showing the Fracture Critical element is in Poor condition. 2) Safety Inspection Report, Fracture Critical Bridge Inspection Report, or Special Inspection Report shows that the Fracture Critical element is in Poor Condition.
DRF-2	Design Redundancy	Bridge has a history of vehicular impacts due to low vertical clearance.	The DRF can be set to 1.00 if requested and the supporting document shows the following: - The Fracture Critical element of a bridge has a history of any vehicular impacts due to inadequate vertical clearance.  For FC, see <a href="https://www.fhwa.dot.gov/bridge/120620.cfm">https://www.fhwa.dot.gov/bridge/120620.cfm</a> ; and Fed Item 92A	1) Safety Inspection Report, Fracture Critical Bridge Inspection Report, or Special Inspection Report shows evidence of low height hits to the bridge and the Fracture Critical Element is in jeopardy of being hit. 2) Crash Reports showing evidence of the low height hits to the Fracture Critical element or nearby features indicating the Fracture Critical Element is in jeopardy of being hit.
DRF-3	Design Redundancy	Bridge is fracture critical and ADT is less than 1,000.	The FC subfactor score (of the DRF score) can be set to 0.00 if requested and the supporting document shows the following: - If the ADT of a Fracture Critical structure is less than 1,000.  For FC, see <a href="https://www.fhwa.dot.gov/bridge/120620.cfm">https://www.fhwa.dot.gov/bridge/120620.cfm</a> ; and Fed Item 92A	1) ADT < 1000 per BrM database, ADT from published information from the Traffic Engineering Division, or updated traffic counts.
SCF-1	Structure Capacity	Bridge requires posting and carries an Interstate or Primary road.	The SCF can be set as follows, if requested and the supporting document shows that the bridge requires a posting: - a minimum SCF of 0.65 for a bridge on the Primary System - a SCF of 1.00 for a bridge on the Interstate System	1) Inspection Report with load rating showing the need to post the bridge.



# State of Good Repair Bridge Program

## Project Priority Scoring – Smart Flags (2 of 2)

Summary of Override Exceptions for SGR Bridge Factor Scores (July 1, 2018)				
Smart Flag Code	Applicable Factor	Short Description (SMART Portal)	Description of Smart Flag	Required Supporting Documentation (DBE must place supporting documents in the bridge file at the district office, note SGR program can be audited)
SCF-2	Structure Capacity	A fracture critical element of a bridge that has significantly deficient vertical clearance.	<p>The SCF can be set as follows, if requested and the supporting document shows that the If the Fracture Critical Element of a bridge has significantly deficient Vertical Clearance versus the Required Vertical Clearance for the Functional Class of the roadway below the bridge:</p> <ul style="list-style-type: none"> <li>- a minimum SCF of 0.50 for a bridge on the Secondary System</li> <li>- a minimum SCF of 0.75 for a bridge on the Primary System</li> <li>- a SCF of 1.00 for a bridge on the Interstate System</li> </ul> <p>For FC, see <a href="https://www.fhwa.dot.gov/bridge/120620.cfm">https://www.fhwa.dot.gov/bridge/120620.cfm</a>; and Fed Item 92A</p>	1) Inspection Report citing deficient vertical clearance and validated with BrM data.
SCF-3	Structure Capacity	Bridge has a history of accidents attributable to features of the bridge.	<p>The SCF can be set to 1.00 if requested and the supporting document shows the following:</p> <ul style="list-style-type: none"> <li>- Bridge has a history of accidents attributable to features of the bridge.</li> </ul>	1) Crash Reports showing evidence that features of the bridge caused the accidents.
CEF-1 (Superseded by CEF-3)	Cost Effectiveness	Bridge is a parallel bridge on the same route to another bridge that is also eligible for SGR funding (or already has been funded with SGR funding).	<p>Regarding parallel structures on the same route (example: NB and SB bridge on the interstate) in which both are being considered individually for SGR funding, if it is more cost effective to complete the construction of both bridges concurrently and both bridges can be fully funded that funding round, the DBE may request that the lower scoring bridge be given a Cost-Effectiveness Factor (CEF) score so that it has an overall CEF score equivalent to the higher scoring dual bridge.</p> <p>If both bridges cannot be fully funded in the current round, then the DBE may request that the dual bridges be skipped as a unit until the next funding round.</p>	<p>1) Statement of intentions</p> <p>2) Supporting documentation indicating that it is more cost-effective to complete the bridge work on the dual bridges at the same time.</p>
CEF-2	Cost Effectiveness	Bridge currently has legacy Dedicated Bridge Funds and needs SGR funds to fully fund the project.	<p>The CEF can be set to 1.00 if requested and the supporting document shows the following:</p> <ul style="list-style-type: none"> <li>- If the bridge currently has legacy DBF funds and needs SGR funds to fully fund the project.</li> </ul> <p>DBE to review all DBF projects that are eligible for SGR funds, and request adjustments accordingly.</p>	1) Project Pool has DBF funds on the project.
CEF-3	Cost Effectiveness	The bridge project can be combined with other SGR funded bridge projects that will result in significant cost savings through reduced overall mobilization, MOT, or other synergies due to combining projects into one project.	<p>The Cost-Effectiveness Factor (CEF) for all the SGR eligible bridges in this group can be set to the CEF of the bridge in the group with the highest CEF if requested and the supporting document shows the following:</p> <ul style="list-style-type: none"> <li>- The bridge project can be combined with other SGR funded bridge projects that will result in significant cost savings through reduced overall mobilization, MOT, or other synergies due to combining projects into one project.</li> <li>- Bridges meeting this requirement are parallel/dual bridges, bridges in immediate sequence, or bridges that are part of a single interchange.</li> <li>- Sequential bridges shall be on a single route and shall not be more than 1 mile apart for bridges carrying Secondary System roads, 2 miles apart for bridges carrying Primary System roads, and three miles apart for bridges carrying Interstate System roads.</li> </ul>	<p>1) Supporting documentation indicating that it is more cost-effective to complete the bridge work on parallel/dual bridges, bridges in immediate sequence, or bridges that are part of a single interchange at the same time.</p> <p>2) Evidence includes a comparison of the following showing that Option B below had significant cost savings over Option A below:</p> <ul style="list-style-type: none"> <li>a) The total cost for Project Cost Estimates for individual bridge projects that include the group of bridges.</li> <li>b) A Project Cost Estimate Cost for a project with the group of bridges.</li> </ul>



**SGR BRIDGE LOCALY-OWNED BRIDGE PROGRAM  
SCHEDULE FOR  
UPDATE TO FY2023 -FY2028 SYIP  
(August 12, 2021)**

**PRE-APPLICATIONS**

→ August 16, 2021	- SMART Portal opens for localities to submit pre-applications
→ September 17, 2021	- SMART Portal closes for localities to submit pre-applications
September 20, 2021	- SMART Portal opens for district validation of pre-applications

**FINAL APPLICATIONS**

**(only structures that received a pre-application)**

→ October 25, 2021	- SMART Portal opens for localities to submit full-applications
→ December 3, 2021	- SMART Portal closes for localities to submit full-applications ←
December 6, 2021	- SMART Portal opens for district validation of full-applications ← Estimate Finalized
March 2022	- SMART Portal Closes for CO validation - SGR ranking completed - Draft Project selection completed - Districts have created all Temporary UPCs
→ April 2022	- Draft update presented to the CTB at April CTB meeting
→ June 2022	- CTB adopted update to the FY202 to FY2029 SYIP at June CTB meeting ←

Project Cost Estimate  
From Pre-Scoping  
Becomes The Project Budget

# SGR Program

## Bridge Project Funding Availability

- **SGR Funding used for the following:**
  - 1<sup>st</sup> priority: budget increase on existing projects
  - 2<sup>nd</sup> priority: adopting new projects to SYIP
- **SGR bridge funding availability**
  - Please contact your local district representative as to the amount of funds available for your district
  - Information on funding already relayed to local district representatives
  - SGR eligible bridge list already emailed to localities
- **Available SGR funding levels subject to change**
  - At any time due to budget changes on existing projects
  - Program funding levels are adjusted each year
    - Biennially based on a needs assessment
    - Annually for revenue adjustments

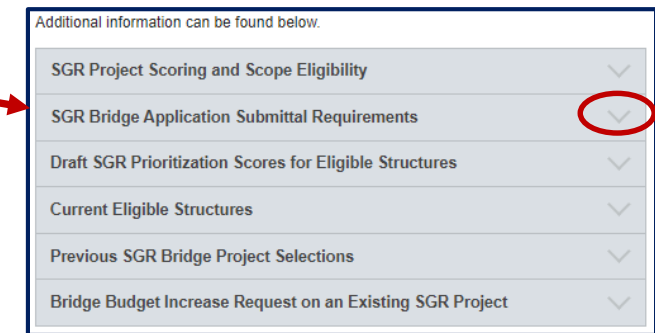
District	Technical Point of Contact District Bridge Engineer	Primary Point of Contact District Locality Liaison
Bristol	John Bechtold, P.E., PTOE 276-696-3365 <a href="mailto:John.Bechtold@vdot.virginia.gov">John.Bechtold@vdot.virginia.gov</a>	Matthew Cox 276-696-3281 <a href="mailto:Matthew.Cox@VDOT.Virginia.gov">Matthew.Cox@VDOT.Virginia.gov</a>
Salem	Dean Hackett, P.E. 540-387-5311 <a href="mailto:Dean.Hackett@VDOT.Virginia.gov">Dean.Hackett@VDOT.Virginia.gov</a>	Jay Guy 540-387-5247 <a href="mailto:james.guy@vdot.virginia.gov">james.guy@vdot.virginia.gov</a>
Lynchburg	Frank Lukanich, P.E. 434-856-8279 <a href="mailto:Frank.Lukanich@VDOT.Virginia.gov">Frank.Lukanich@VDOT.Virginia.gov</a>	Jay Brown 434-856-8246 <a href="mailto:Jay.Brown@VDOT.Virginia.gov">Jay.Brown@VDOT.Virginia.gov</a>
Richmond	Jeff Hill, P. E. 804-624-6139 <a href="mailto:Jeff.Hill@VDOT.Virginia.gov">Jeff.Hill@VDOT.Virginia.gov</a>	Larry Hagin 804-609-5329 <a href="mailto:larry.hagin@vdot.virginia.gov">larry.hagin@vdot.virginia.gov</a>
Hampton Roads	Fuller, Christine, P.E. 757-956-3203 <a href="mailto:Christine.Fuller@vdot.virginia.gov">Christine.Fuller@vdot.virginia.gov</a>  Ali, Mohamed, P.E. 757-956-3206 <a href="mailto:Mohamed.Ali@VDOT.Virginia.gov">Mohamed.Ali@VDOT.Virginia.gov</a>	Sonya Hallums-Ponton 757-925-2616 <a href="mailto:Sonya.Hallums-Ponton@VDOT.Virginia.gov">Sonya.Hallums-Ponton@VDOT.Virginia.gov</a>
Fredericksburg	Annette Adams, P.E. 540-372-3583 <a href="mailto:Annette.Adams@VDOT.Virginia.gov">Annette.Adams@VDOT.Virginia.gov</a>	Susan Gardner 540-899-4103 <a href="mailto:Susan.Gardner@VDOT.Virginia.gov">Susan.Gardner@VDOT.Virginia.gov</a>
Culpeper	Teresa Gothard, P.E. 540-829-7635 <a href="mailto:Teresa.Gothard@VDOT.Virginia.gov">Teresa.Gothard@VDOT.Virginia.gov</a>	Greg Banks 540-727-3380 <a href="mailto:Gregory.Banks@VDOT.Virginia.gov">Gregory.Banks@VDOT.Virginia.gov</a>
Staunton	Rex Pearce, P.E. 540-332-9104 <a href="mailto:Rex.Pearce@VDOT.Virginia.gov">Rex.Pearce@VDOT.Virginia.gov</a>	Michael Branscome 540-332-9057 <a href="mailto:Michael.Branscome@VDOT.Virginia.gov">Michael.Branscome@VDOT.Virginia.gov</a>
NOVA	Gary Runco, P.E. 703-259-3341 <a href="mailto:Gary.Runco@VDOT.Virginia.gov">Gary.Runco@VDOT.Virginia.gov</a>	Maria Sinner 703-259-2342 <a href="mailto:Maria.Sinner@VDOT.Virginia.gov">Maria.Sinner@VDOT.Virginia.gov</a>

# SGR Bridge Program Pre-Scoping Requirements

## IIM-LD-260/IIM-IID-11: District & Central Office Project Application Review & Validation

### SGR BRIDGE WEBPAGE: Accordion tab on “SGR Project Scoring and Scope Eligibility”

- **Pre-Scoping Report**
  - Project Description
  - Scope Justifications
  - Significant Scope Elements, and outline Scope Elements Not Eligible for SGR
  - Alternative Analysis
  - Risk Assessment
  - Proposed Smart Flags
- **Conceptual Drawings or Sketches**
  - Proposed Plan View of Structure and Approaches
  - Existing and Proposed Cross Section of Deck
  - Existing and Proposed Cross Section of Immediate Approach Roadway
- **Project Cost Estimate**
  - SGR Proposed Scope Estimate for recommended alternative
  - SGR Eligible Structure Replacement



**Project Cost Estimate  
at Project Selection  
(if selected)  
Becomes your  
Project Budget**

**Note: Sample pre-scoping reports / documents are being posted on SGR bridge webpage**

## State of Good Repair Bridge Program Pre-Application Requirements

- **Completing a full application in SMART Portal**
  - Must submit a pre-application for ALL bridges in a given locality to be eligible to submit full application BULK SUBMIT in SMART Portal ↑
- **REQUIRED Submittal Documentation**
  - Draft progress pre-scoping report
- **RECOMMENDED Submittal Documentation**  
**substantial draft documents, if available, to help us help you**
  - Proposed Smart Flags, if applicable
  - Conceptual Drawings or Sketches
  - Project Cost Estimate
    - SGR Proposed Scope Estimate for recommended alternative (if not a bridge or culvert replacement)
    - SGR Eligible Structure Replacement

## State of Good Repair Bridge Program

### Full Application Requirements

- **Completing a full application in SMART Portal**
  - 1. Must have submitted a pre-application for ALL bridges in a given locality
  - 2. Must submit a full application for ALL eligible bridges in a given locality (BULK SUBMIT in SMART Portal)
- **REQUIRED Submittal Documentation**
  - Pre-Scoping Report
  - Proposed Smart Flags, if applicable
  - Conceptual Drawings or Sketches
  - Project Cost Estimate (including cost estimate workbook and backup information)
    - SGR Proposed Scope Estimate for recommended alternative (if not a bridge or culvert replacement)
    - SGR Eligible Structure Replacement

## State of Good Repair Bridge Program Scope Eligibility

- Bridge projects that receive SGR funding shall meet the requirements in IIM-S&B-95: IIM-S&B-95 State of Good Repair Bridge Project Selection and Eligible Work Items
- *“The scope of work for the project must achieve all three requirements below to receive SGR funds.*
  - *Removes the bridge’s poor (structurally deficient (SD)) condition status [to fair or good condition]*
  - *Meets the definition of a bridge rehabilitation or replacement*
    - *in Federal Highway Administration’s Bridge Preservation Guide dated August 2011*
  - *Adds or restores strength. Examples of strength restoration include patching, repair or replacement of deck, superstructure or substructure elements”*

## State of Good Repair Bridge Program Scope Eligibility Guidance

- **Reminder to applicant as to the premise in the Code of Virginia for SGR**
  - SGR reconstruction/replacement bridge projects are capital improvement projects in a construction (and SYIP) program for the preservation program for bridges in poor (SD) condition.
  - SGR is not a capacity expansion or safety program, and not structured to evaluate those improvements
- **Pre-Scoping: Application shall pay close attention to requirements below in terms of the development of the SGR bridge project scope that focuses in reconstruction or replacement in kind.**
  - IIM-S&B-95: State of Good Repair Bridge Project Selection and Eligible Work Items
  - Manual of the S&B Division, Part 2, Ch. 6 (Geometrics), File No. 06.01-5 (Case 2)
  - IIM-LD-235, titled “Common Sense Engineering (CSE) and Context Sensitive Solutions (CSS)” \*
  - IIM-LD-255 (Practical Design Flexibility in the project development process) \*

\* This guidance should be used during pre-scoping and throughout the design process.



## Pre-Scoping Alternative Analysis (Chapter 32)

The pre-scoping report shall include an alternative analysis completed in accordance with [Part 2, Chapter 32, of the Manual of the S&B Division](#). The SGR bridge program will only fund up to the estimate for the recommended alternative (SGR repair scope).

- **Bridge Alternatives**
  - Bridge Replacement
  - Bridge Rehabilitation – Superstructure Replacement \*
  - Bridge Rehabilitation – Deck Replacement \*
  - Bridge Rehabilitation – Minor (includes partial element replacement) \*
- **Large Culvert Alternatives**
  - Culvert Replacement
  - Culvert Rehabilitation (includes lining of culverts)

\* comprehensive restorative (condition-based) maintenance of elements that are not replaced is expected.

## Pre-Scoping Alternative Analysis (Chapter 32)

*The mitigating factors below, if causing significant impacts, may be used per Chapter 32 to justify a replacement if the rehabilitation or repair/preserve cost is less than 65% of replacement. The applicant should discuss these as soon as possible with district and well in advance of the submission of the full-application.*

- *Scour susceptibility*
- *Hydraulic inadequacy*
- *Fracture critical superstructure elements*
- *Alkali-silica or alkali-carbonate reactive aggregate*
- *Accident history or potential*
- *Inadequate horizontal or vertical clearances*
- *Unsafe site distance or roadway alignment (vertical or horizontal)*
- *Requirements to accommodate bicycle and/or pedestrian access*
- *Overloads/effects on permit vehicles*
- *Ship collisions or U.S. Coast Guard issues*
- *Extraordinary environmental constraints*
- *Life Cycle Cost Analysis indicates that replacement is the most cost-effective alternative over a 75 year life*

Applies to SGR or other preservation work.

## CSE and PBPD Aligns with SGR Programs

### IIM-LD-235 – Common Sense Engineering (CSE)

- “CSE does not dismiss engineering policies and/or standards. Rather, it aims to increase flexibility to produce efficient and effective designs that include essential improvements while meeting the project purpose, need/scope and budget. VDOT must ensure that every engineering decision and every dollar spent is focused on **improving VDOT’s overall transportation system.**”

### IIM-LD-255 – Performance Based Practical Design (PBPD)

- “The following information offers the foundation for overall thought and general policy to achieve more focused transportation improvements at lower costs. The goal of PBPD is to appropriately allocate limited resources to optimize system wide transportation improvements. This type of approach allows VDOT to focus on maximizing transportation system improvements statewide, **rather than maximizing improvements in a select few locations.**”
- “The overall objective of VDOT is to appropriately allocate limited resources to optimize system wide transportation improvements. VDOT must ensure that every project, every engineering decision, every dollar on every project budget is focused on improving VDOT’s overall transportation system. There must be an overall systematic synergy created between all facets of program development (planning, engineering, right-of-way acquisition, construction, operations and maintenance) which has a sole focus of improving VDOT’s transportation system.”

# State of Good Repair Bridge Program Design Exceptions and Design Waivers

## Explore design waivers and design exceptions during planning and pre-scoping

- **Discuss the viability of DW or DE with district**
  - as soon as possible
  - well in advance of the submission of the full-application
- **The contingency in the project cost estimate should factor in risk of the viability of the DW or DE. This risk, or associated contingency, should reduce with the following:**
  - investigation
  - Viability
  - buy-in of the DW or DE
- **Discussed any assumed design waiver (DW) or design exception (DE) in the pre-scoping report**
  - including a summary of findings from the previous points
  - In the risk analysis.

## DE and DW requirements can be found in below

- [Manual of the S&B Division, Part 1, Design Exception / Waivers / Approvals, File No. Pre.02-1 to 02-10](#)

# State of Good Repair Bridge Program

## IIM-S&B-95: Eligible Scope Items within Touchdown Points



- 1) Preliminary engineering costs
  - 2) Right of way costs
  - 3) Maintenance of traffic, including temporary detours
  - 4) Railroad flagging and coordination
  - 5) Environmental protection and stormwater management, including erosion and sediment control
  - 6) Temporary causeways and contractor access structures
  - 7) Temporary shoring
  - 8) Temporary drainage
  - 9) In-kind replacement or relocation of existing utilities for which the bridge owner is responsible
  - 10) Dismantling and removal of existing structure
  - 11) Bridge or culvert construction costs, including wing walls and head walls
  - 12) Slope protection and associated drainage
  - 13) Transitions to existing roadway to accommodate minimum design criteria
  - 14) For bridges with inadequate vertical clearances, roadway work associated with the lowering of the roadway below the bridge to improve vertical clearance
  - 15) Approach roadway work
  - 16) Approach slabs
  - 17) Guardrail and attachments as limited by Chapter 6\*
  - 18) Pavement markings
  - 19) Construction engineering and inspection services
  - 20) Incentive bonuses
- \*Guardrail work required by Chapter 6 may extend beyond the touchdown points and is eligible for reimbursement under the SGR program.*

## State of Good Repair Bridge Program

### IIM-S&B-95: Examples on Non-Qualifying Scope Items

IIM-S&B-95 provides some examples below of work items that do not qualify for SGR funds:

- 1) Interchanges and ramps (SGR funds may be used to rehabilitate or replace eligible bridges that are part of interchange projects, but funding is strictly limited to the bridge work within the limits established by the project touchdown points).
- 2) Any permanent work item located beyond the touchdown points
- 3) Bridge widening exceeding limits established in IIM-S&B-95
- 4) Bridge widening to accommodate bicycle or pedestrian facilities **unless the approach roadway already has such facilities**
- 5) Improvements to connecting roadways that are not a direct result of the new roadway geometry associated with the bridge project. Connecting roads are those that are within the project limits but do not carry the same route as the bridge.
- 6) Utility replacement beyond in-kind replacement of existing utilities for which the bridge owner is responsible. Payments for in-kind replacement of privately-owned utilities are the responsibility of the utility owner.

**Non-qualifying work items may be part of an SGR project, but they must be funded by other sources. Such projects with must have separate estimates for SGR and non-SGR work.**

## IIM-S&B-95: Scope Eligibility Items

### Increasing Length of Bridge When Bridge Replaced

**IIM-S&B-95:** *“For bridges where the recommended action is replacement, the replacement structure may need to be longer than the original to accommodate the following:*

- *hydraulics*
- *railroad requirements*
- *future widening of a roadway below \**

*\* If the constrained long range plan includes provisions to widen the facility below the bridge, the additional bridge length necessary to accommodate the wider facility is eligible for SGR funding for bridges designed in accordance with Chapter 6 of the Manual of the Structure and Bridge Division.”*

*Otherwise, the additional bridge length is not eligible for SGR funding.*



## IIM-S&B-95: Scope Eligibility Items Touchdown Points for Approach Roadway

Per IIM-S&B-95, “Project limits are established by the “touchdown points” at either end of the project. Projects must employ Common Sense Engineering (CSE), using the minimum length to safely tie back into the approach roadway. **Unless approved by the Assistant State Structure and Bridge Engineer (Maintenance)**, touchdown points shall be limited as indicated in this IIM. The “Figure #” in the table below refers to illustrative figures shown in subsequent pages.”

### Approval

- as part of full-application
- ASAP if discovered during project delivery (address budget increase)

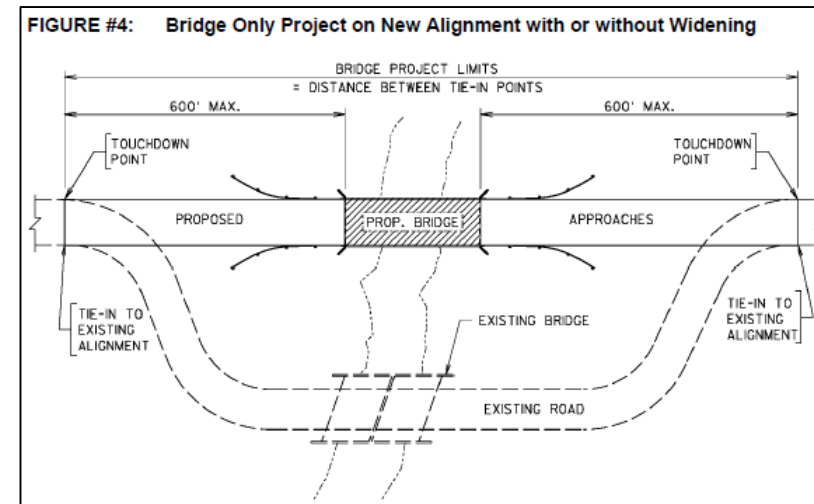
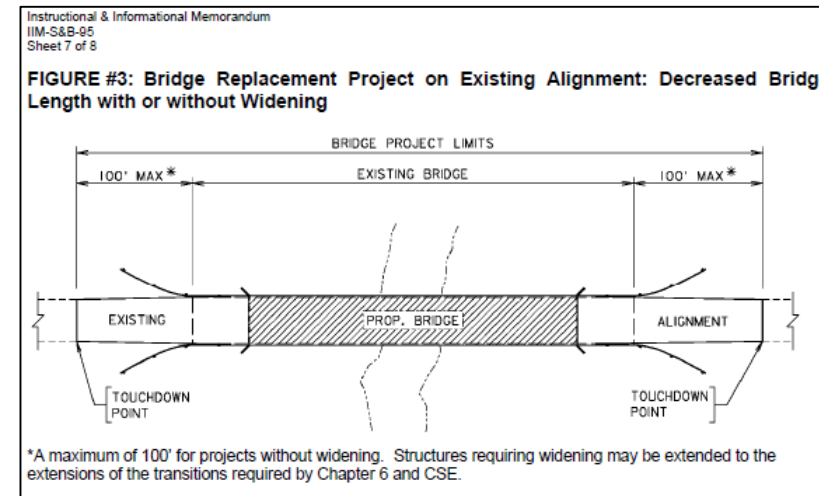
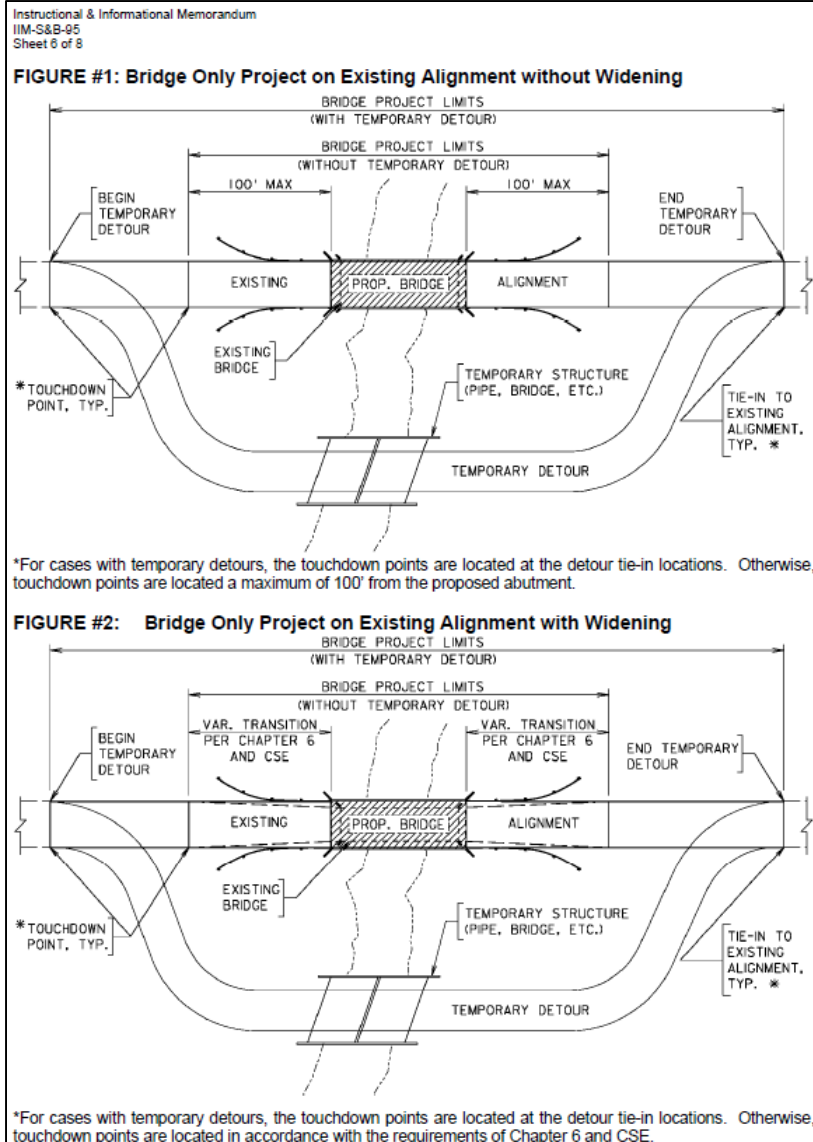
Touchdown Points for Different Conditions				
Figure #	Bridge Widening <sup>1</sup>	Part of Adjacent Roadway Project?	Horizontal Roadway Alignment	Maximum Distance of Touchdown Points from Ends of Abutments <sup>2</sup>
1	No	No	Existing	100' or to Temporary Detour Tie-in Point
2	Yes	No	Existing	Minimum Required by CSE & "Bridge Only" Section of Chapter 6 or to Temporary Detour Tie-in Point
3	Either	Either	Existing	100' from Existing Abutment
4	Either	Either	New	600' or Tie-in Points

<sup>1</sup>A “Bridge Widening” refers to cases where additional bridge width is provided in order to meet geometric requirements or match existing approach roadway. Additional lanes, sidewalks and paths are not eligible unless they are present on the existing approach roadway.

<sup>2</sup>The touchdown point from one abutment may exceed the maximum permissible distance shown as long as the combined distance from the two abutments to the two touchdown points does not exceed twice the indicated limit (200' total for Figures 1 and 3, and 1200' total for Figure 4).

# IIM-S&B-95: Scope Eligibility Items

## Touchdown Points for Approach Roadway



## IIM-S&B-95: Scope Eligibility Items Eligible Bridge Widening

Per IIM-S&B-95, “*In some instances it may be necessary to widen a bridge in order to meet minimum geometric standards, improve safety or match existing roadway (not to add additional lanes).*”

However, again, the following guidance should be used to determine required bridge width.

- Manual of the S&B Division, Ch. 6 (Geometrics), File No. 06.01-5 (Case 2)
- IIM-LD-235, titled “Common Sense Engineering (CSE) and Context Sensitive Solutions (CSS)” \*
- IIM-LD-255 (Practical Design Flexibility in the project development process) \*
- Manual of the S&B Division, Part 1, Design Exception / Waivers / Approvals, File No. Pre.02-1 to 02-10 \*\*

\* This guidance should be used during pre-scoping and throughout the design process.

\*\* Any assumed design waiver or design exception should be discussed in the pre-scoping report. The applicant should discuss the viability of DW or DE as soon as possible with district and well in advance of the submission of the full-application.

## IIM-S&B-95: Scope Eligibility Items Eligible Bridge Widening

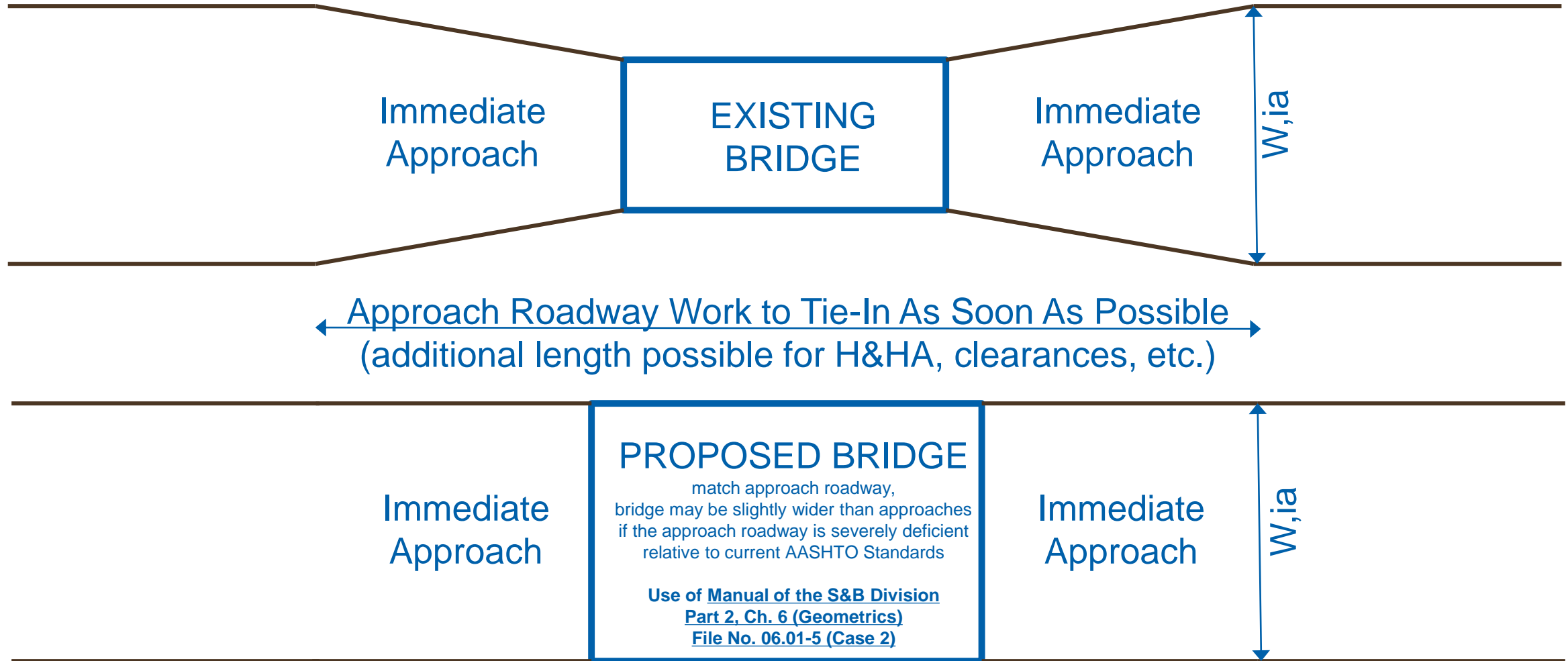
**Per IIM-S&B-95, “Funds for the portion of the bridge beyond the eligible width must be generated from sources other than SGR funds unless one or more of the conditions below applies:**

- a. Additional width is required to meet horizontal sight distance requirements.***
- b. Safety or crash data indicate a need for additional width. Provide documentation in the project file on accident data at the site.***
- c. Staged construction requires additional width to maintain traffic on the bridge during construction. Provide Maintenance of Traffic plans in project file.***
- d. Existing one-lane bridge requires a two-lane bridge.***
- e. Increased bridge width for prestressed voided slab/box beam bridges in order to use standard width shapes.***
- f. Increased bridge width to simplify the design and/or construction for structures on flat horizontal curve geometrics (i.e., width increased by middle ordinate to allow a straight bridge in lieu of curved bridge).“***

**For ‘c’, A HUBCAP analysis justifying additional may also be requested (although not currently sated in IIM-S&B-95).**

## IIM-S&B-95: Scope Eligibility Items

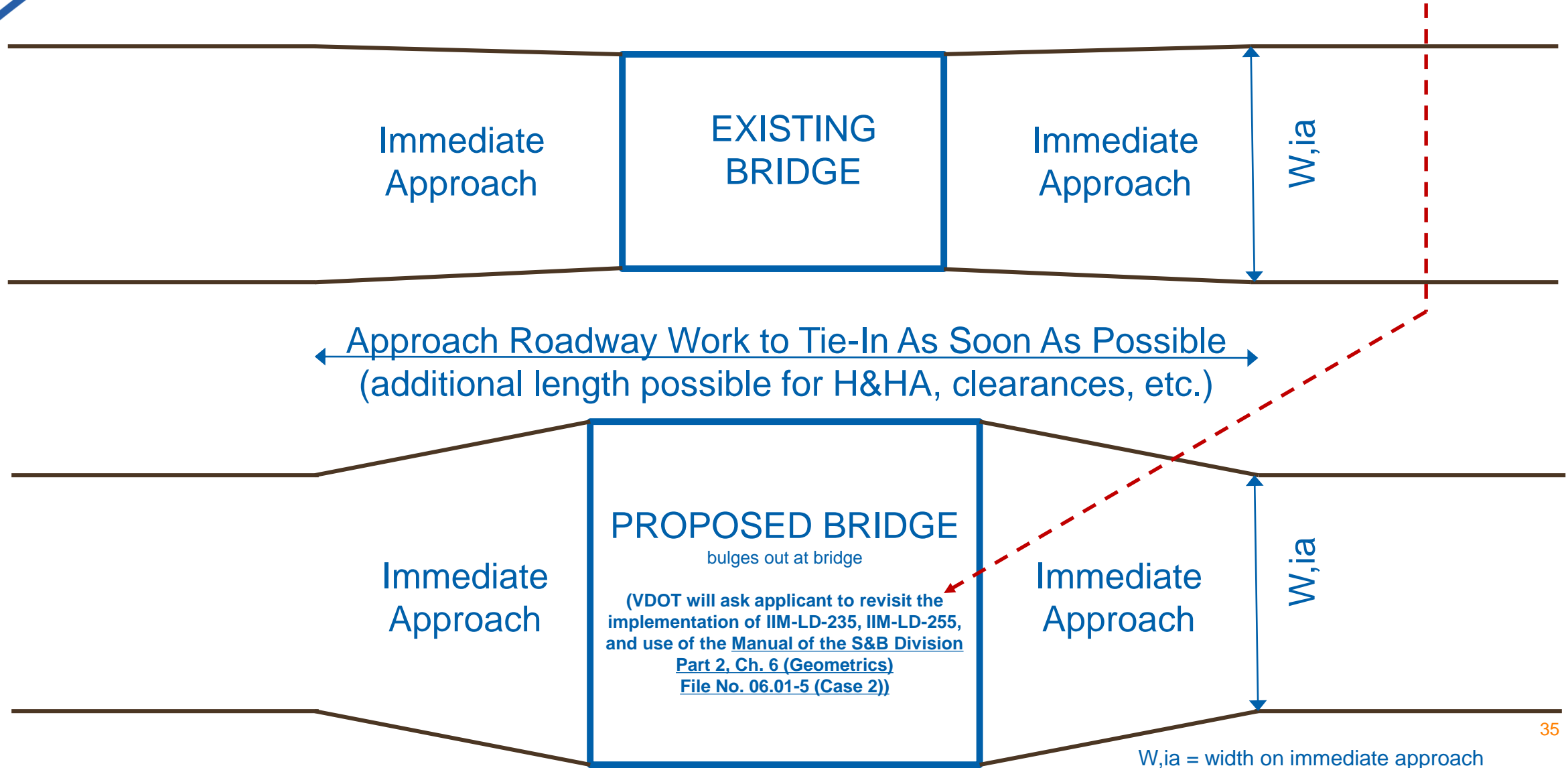
### Bridge Width – Simplified Concept Example (acceptable)



$W_{ia}$  = width on immediate approach

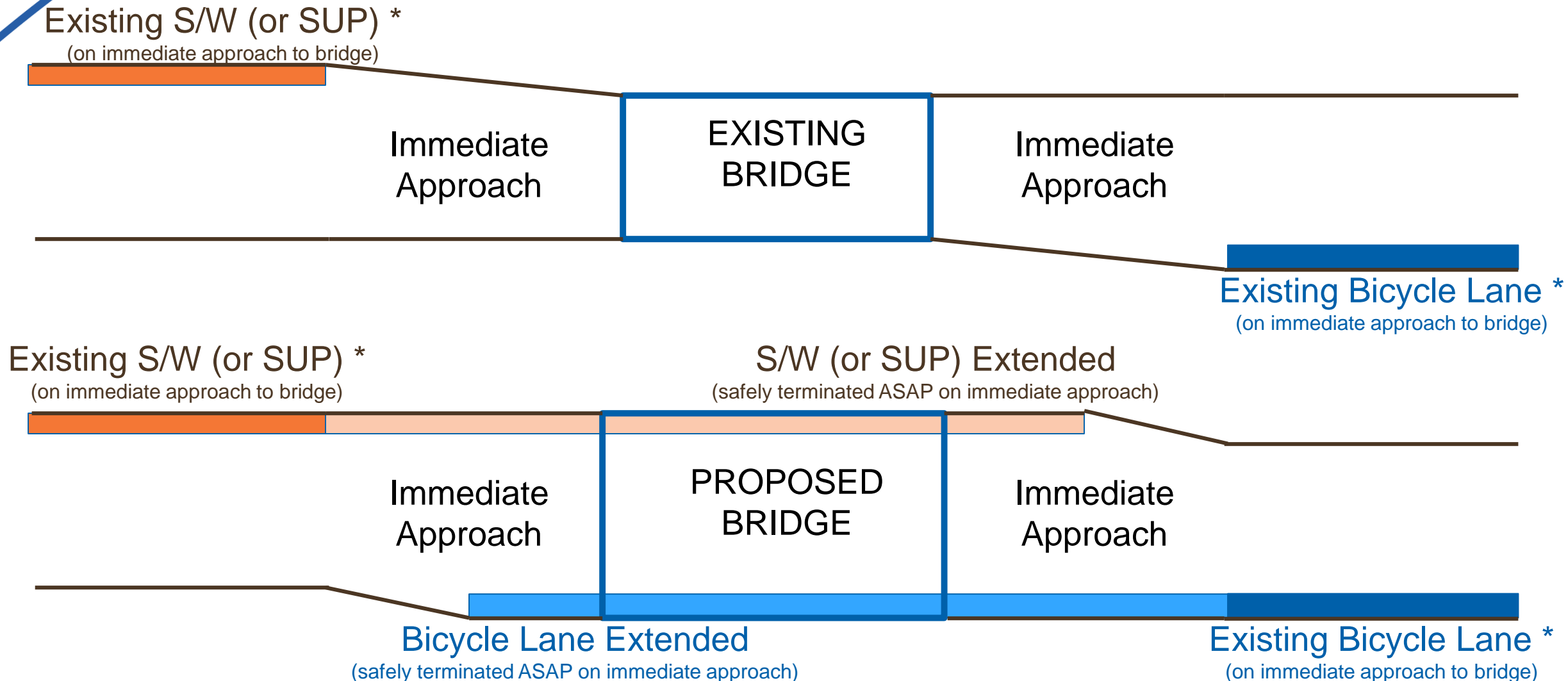
## IIM-S&B-95: Scope Eligibility Items

### Bridge Width – Simplified Concept Example (will be questioned)



# IIM-S&B-95: Scope Eligibility Items

## Special Case: Widening for Existing Bicycle Pedestrian Facilities



\* Will also consider on a case by case basis if a fully funded project to build bicycle-pedestrian facility is in the SYIP by other funding sources.  
(Note: VDOT Transportation Mobility and Planning Division and S&B Division working on a help guide.)



# Pre-Scoping Report

## Significant Scope Elements

- **All significant scope items should be included in pre-scoping report. Some examples are below.**
  - **Bridge Configuration**
  - **Features Carried (including approach roadway tie-in points, alignment, profile, and cross section)**
  - **Features Intersected (road, water, railroads, clearances)**
  - **Geotechnical (roadway, bridge)**
  - **Maintenance of Traffic (detour, offset alignment, part-width-construction)**
  - **Traffic**
  - **Right-of-Way and Utility Impacts**
  - **Hydrologic and Hydraulic Requirements**
  - **Environmental Impacts and Permits**
  - **Stakeholders**
  - **Bicycle-Pedestrian Features**
  - **Constructability Issues**
  - **Application of the following requirements**
    - Manual of the S&B Division, Part 1, Design Exceptions / Waivers / Approvals
    - Manual of the S&B Division, Part 2, Ch. 6, File No. 06.01-5 (Case 2)
    - IIM-LD-235, titled “Common Sense Engineering (CSE) and Context Sensitive Solutions (CSS)”
    - IIM-LD-255, titled “Practical Design Flexibility in the project development process”
  - **Complex Project Elements (may be covered in part by Risk Assessment)**

# Pre-Scoping Requirements Conceptual Drawings or Sketches

**Pre-scoping report will include conceptual drawings (or sketches).**

- **Proposed Plan View of Structure and Approaches including the following:**
  - limits of structure
  - approach road tie in points
  - maintenance of traffic
- **Cross Sections of Deck**
  - Existing & Proposed
- **Cross Section of Immediate Approach Roadway**
  - Existing & Proposed
  - Show dimensions of lanes and shoulders, and guardrail

# Pre-Scoping Requirements

## Project Cost Estimates

Project cost estimates shall be submitted per the requirements below.

- **Two project cost estimates are required as follows:**
  - SGR Repair Estimate \* (for proposed repair scope, and not required scope is replacement)
  - SGR Structure Replacement (In kind Replacement)
- **Project cost estimates are to comply with the following requirements:**
  - VDOT Cost Estimating Manual (new)
  - VDOT Project Management Procedure PMO-3.6, titled "Project Development Budget and Estimates"
  - **SGR Bridge Applications shall include a Cost Estimate Workbook (CEWB)**
    - A new version of the CEWB is about to be released and new version will be used in applications
  - Detailed estimate documentation (PCES documentation or equivalent)
- **Estimates per the CEWB shall be provided for each phase (PE, RW & CN Phases) and shall include below:**
  - Base Costs (without Inflation and Contingency)
    - Defined Costs
    - Allowances
  - Contingency Cost (applied to Base costs)
  - Inflation Cost (applied to Base costs and contingency costs)

Project Cost Estimate  
at Project Selection  
(if selected)  
Becomes your  
Project Budget

# Cost Estimate Workbook - Form

(Current show, updated form soon to be released)

SYIP PROJECTS DETAILED PROJECT COST ESTIMATE SUMMARY (Version: 1/21/2020 - CTS Modified)				
Portal ID:		Project UPC:		
Prepared By:		Milestone	Creation/Pre Scope	
Reviewed By:		Date:		
County/City/Town:		Tier Level	1	
<b>Preliminary Engineering</b>				
Project Estimate Component		Proposed Project Cost Estimate (\$)		
Discipline	Source	Base (\$)	Contingency (%)	Total
Roadway		\$ 1	200.00%	\$3
Hydraulics				\$0
In-plan Utilities				\$0
Traffic				\$0
Structures/Bridges				\$0
Materials/Geotech				\$0
Survey				\$0
Environmental				\$0
Right of Way				\$0
Other				\$0
VDOT Oversight Costs				\$0
Total PE Phase Estimate		\$ 1	200.00%	\$3
PE Base Estimate Date (XX/XX/XXXX)				
PE Phase Dates (XX/XX/XXXX)	Start Date		End Date	
<b>Right-of-Way &amp; Utilities</b>				
Discipline	Source	Base (\$)	Contingency (%)	Total
Right-of-Way		\$2	200.00%	\$6
Out-of-Plan Utilities (power, cable, gas, etc.)				\$0
VDOT Oversight Costs				\$0
Total RW Phase Estimate		\$2	200.00%	\$6
RW Base Estimate Date (XX/XX/XXXX)				
RW Phase Dates (XX/XX/XXXX)	Start Date		End Date	

Construction				
Discipline	Source	Base (\$)	Contingency (%)	Total
Mobilization		\$3	200.00%	\$9
MOT				\$0
Roadway				\$0
Hydraulics				\$0
In-plan Utilities				\$0
Traffic				\$0
Structures/Bridges				\$0
Materials/Geotech				\$0
Soundwalls				\$0
Other				\$0
Total Bid Items		\$3	200.00%	\$9
Orders (Percentage of Bid Items)	5% to 10% max			0
Railroad Flagging/Coordination				0
State Forces				0
State Police				0
Contract Requirements (Incentive/Disincentive)	5%			0
Construction Engineering (Inspection)	Environmental Inspection (\$)			0
	VDOT or Locality (\$)			0
	VDOT Oversight (\$)			0
	Total CEI			0
Total CN Phase Estimate		\$3	200.00%	\$9
CN Base Estimate Date (XX/XX/XXXX)				
CN Phase Start Date (XX/XX/XXXX)				
CN Phase End Date (XX/XX/XXXX)				
Total Project Cost Estimate				\$18

SYIP Total Project Cost Estimate Summary				
Phase	Base (\$) *	Contingency (\$) *	Inflation (\$) **	Total ***
PE Phase Estimate	\$1	\$2	\$3	\$6
RW Phase Estimate	\$2	\$4	\$5	\$11
CN Phase Estimate	\$3	\$6	\$7	\$16
Total Estimate	\$6	\$12	\$15	\$33

\* Use combined Base and Contingency Costs into SMART Portal or PCES workbook.  
 \*\* Obtain Inflation costs from SMART Portal or PCES workbook and enter into highlighted cells.  
 \*\*\* Total Costs shall match with total costs in SMART Portal or PCES.

# Cost Estimate Workbook – Contingency Levels

(Current show, updated form soon to be released)

SYIP PROJECTS															
SUGGESTED CONTINGENCY FOR GIVEN RISK LEVEL															
VERSION: 11/14/2019 (NOTE: These values are for discussion purposes only and are not to be used for live projects until approved and distributed as a formal II&M.)															
	Prescoping Documents (Prior to Project Selection)			scoping Meeting PFI Meeting			Public Hearing Team Meeting			Field Inspection Meeting			Pre-Advertisement Conference Meeting		
Level of Project Development	0% to 10%			20%			40%			75%			100%		
Phase	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
PE	10%	12%	15%	7%	10%	12%	5%	7%	10%	2%	5%	7%	0%	2%	5%
RW	30%	50%	75%	30%	50%	75%	15%	30%	40%	15%	30%	40%	10%	15%	20%
CN	25%	40%	75%	20%	35%	50%	10%	20%	30%	10%	15%	20%	10%	12%	15%
For all milestones prior to Advertisement, each phase (PE, RW, CN) shall have a separate contingency. Contingency is a function of risk and level of project development. Preliminary Engineering (Design) contingency values based on Columbia University project guidance. Construction contingency values based on Advancement of Cost Estimating (ACE) expected level of accuracy - ACE															

Use appropriate contingency

# State of Good Repair Bridge Program Budget Increases on Existing Projects

Follow guidance of Budget Increase Request accordion tab on [SGR bridge webpage](#)

- Significant requirements including bridge budget increase request (BBIR) form
- BBIR form and supporting documentation should be submitted as soon as possible
- Receive a lot of scrutiny especially SGR scope eligibility per IIM-S&B-95, and application of File No. 06.01-5 (Case 2) of Ch. 6 (Geometrics), IIM-LD-235 (CSE) and IIM-LD-255
- Directed to district locality liaison and district bridge engineer
- Require Central Office Approval
  - Less than or equal to thresholds: State S&B Engineer (delegated to assistant for Maintenance)
  - Thresholds exceeded: Chief Engineer

## Chief Engineer Approval Required When Thresholds Exceeded

Current Total Project Budget	Threshold for Additional Funds Being Requested
Less than \$5,000,000	20% or greater
From \$5,000,000 to \$10,000,000	\$1,000,000 or greater
Greater than \$10,000,000	10% or greater up to a maximum of \$5,000,000

Bridge Budget Increase Request on an Existing SGR Project

The SGR project selection process requires completion of pre-scoping efforts prior to submittal of the application (or work notification form). The pre-scoping effort establishes a scope for the project that the district or locality will use to establish the project cost estimate, which will then be used by VDOT to calculate the SGR priority score and determine which bridge projects are selected for SGR funding. The project cost estimate developed at pre-scoping will also be used to determine a fund request, which will be approved by the CTB for selected bridge projects as part of their adoption of the SYIP. The approved fund level then becomes the budget for the project.

There are times when an increase in the budget on an existing SGR project is required; for example, due to an unanticipated increase in the project cost estimate caused by an unforeseen circumstance. In such instances, the district shall submit a [Bridge Budget Increase Request \(BBIR\)](#) for the existing project to the Central Office (CO) SGR bridge program manager in order for addition of funds to be considered. Before submitting the BBIR form, the district shall make all appropriate efforts to review a project scope for opportunities to modify or reduce scope to bring the cost back in line with the original budget without sacrificing life cycle benefits and while meeting the requirements for SGR projects established in IIM-S&B-95. The district bridge engineer must submit the BBIR form, along with supporting information and an updated [Cost Estimate Worksheet](#), as outlined in the BBIR form, to the CO SGR bridge program manager for review, recommendation, and routing for approval or disapproval.

Project managers should maintain accurate up to date project cost estimates at all times, including at project milestones, in accordance with VDOT Project Management Procedure PMO 3.6, titled "Project Development Budget and Estimates" and notify the CO SGR bridge program manager as soon as any significant cost increase has been identified. However, for projects administered by VDOT, when a bridge budget increase is requested, formal requests by the district should be submitted at the following milestones and similar milestones for projects not administered by VDOT:

- Public Hearing Milestone (after design approval is received),
- Fund Verification for the right-of-way phase,
- Fund Verification for construction phase (initiating advertisement process), and
- Districts may also submit the BBIR forms in early January as part of the program SYIP update.

The CO SGR bridge program manager will serve as the primary point of contact and coordinate all reviews for all fund requests occurring during or before fund verification for construction phase (initiating advertisement process). The CO SGR bridge program manager will coordinate approvals with the assistant state structure and bridge engineer for bridge maintenance, the state structure and bridge engineer, or the chief engineer as appropriate. Budget increases above the thresholds in the table below will require approval of the Chief Engineer and the BBIR submittal must be accompanied by a brief presentation describing the reasons that additional funding is required. Certain transfers must also be approved by the CTB.

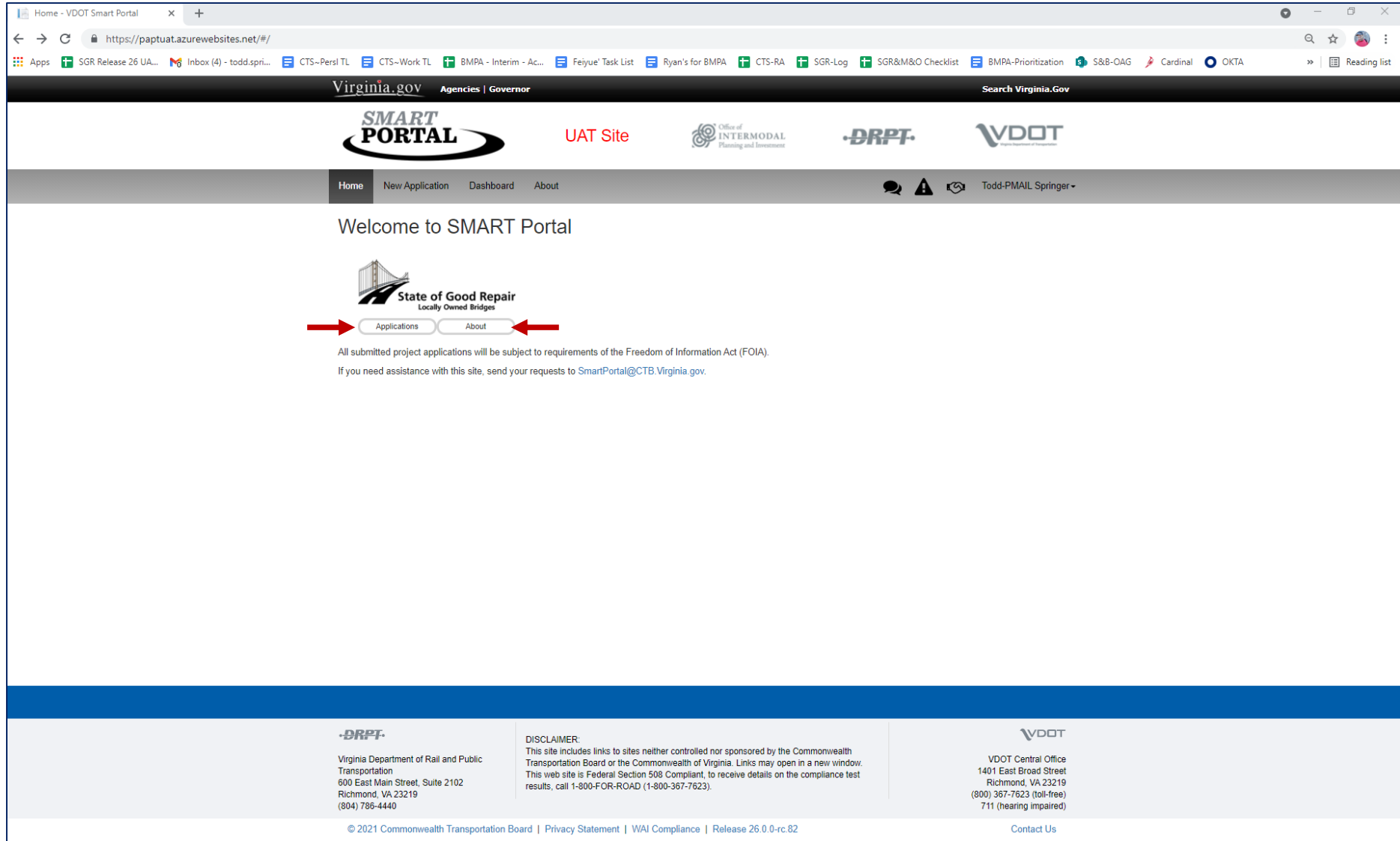
**Chief Engineer Approval Required When Thresholds Exceeded**

Current Total Project Budget	Threshold for Additional Funds Being Requested
Less than \$5,000,000	20% or greater
From \$5,000,000 to \$10,000,000	\$1,000,000 or greater
Greater than \$10,000,000	10% or greater up to a maximum of \$5,000,000

SGR fund requests for projects awaiting potential award must be coordinated between the district, the Construction Division (CD) and the Infrastructure Investment Division (IID), and will only be considered if award of the bid would provide good value to the Commonwealth of Virginia. The CO SGR bridge program manager will support the assessment as needed and may be required to coordinate approval for some SGR aspects (scope changes/increases, scope eligibility for SGR) of the fund request if requested to do so by IID or CD.

# SMART Portal

## SGR Locality-Owned Bridge Applications



Home - VDOT Smart Portal

https://paptuat.azurewebsites.net/#/

Virginia.gov Agencies | Governor Search Virginia.Gov

SMART PORTAL UAT Site Office of INTERMODAL Planning and Investment DRPT VDOT

Home New Application Dashboard About

Welcome to SMART Portal

State of Good Repair  
Locally Owned Bridges

Applications About

All submitted project applications will be subject to requirements of the Freedom of Information Act (FOIA).  
If you need assistance with this site, send your requests to [SmartPortal@CTB.Virginia.gov](mailto:SmartPortal@CTB.Virginia.gov).

DRPT Virginia Department of Rail and Public Transportation  
600 East Main Street, Suite 2102  
Richmond, VA 23219  
(804) 786-4440

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VDOT  
VDOT Central Office  
1401 East Broad Street  
Richmond, VA 23219  
(800) 367-7623 (toll-free)  
711 (hearing impaired)  
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# SMART Portal

## SGR Locality-Owned Bridge Applications Dashboard (mock example)

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Todd-PMail Springer

### State of Good Repair Bridge

PROGRAMS

All 6

State of Good Repair Bridge 8

ID / Name

Fiscal Year

2023

Status

-- Status --

Search

Reset Filters

Application Type

-- Application Type --

Results filtered by: Fiscal Year, Organization

List

Map

[Help Document](#)

Record Count: 2

Federal ID	Facility Carried	Ro...	Featured Inte...	Draft SGR Sc...	Status	Application T...	FY	Last Updated	
105	ARLINGTON...		FOUR MILE ...	0.256	Pending	Pre-Applicati...	2...	08/06/2021 ...	0..
106	WEST GLE...		FOUR MILE ...	0.378	Pending	Pre-Applicati...	2...	08/06/2021 ...	0..

Record Count: 2

Federal ID	Facility Carried	Ro...	Featured Inte...	Draft SGR Sc...	Status	Application T...	FY	Last Updated	
105	ARLINGTON...		FOUR MILE ...	0.256	Ready for S...	Pre-Application	2...	08/10/2021 ...	0..
106	WEST GLE...		FOUR MILE ...	0.378	Ready for S...	Pre-Application	2...	08/10/2021 ...	0..

Bulk Submission of State of Good Repair Bridge 2023 Pre-Application

Applications Ready for Submission

0 / 2

Show Me

Bulk Submission of State of Good Repair Bridge 2023 Pre-Application

Applications Ready for Submission

1 / 2

Show Me

Submit All Forms



# SMART Portal

## SGR Locality-Owned Bridge Applications

### General Pearl (mock example) – To Edit Form

Home New Application Dashboard About

Viewing State of Good Repair Bridge 2023 Pre-Application

ARLINGTON RIDGE RD () over FOUR MILE RUN (105)

Project Status: Pending  
Organization: Arlington County  
Project ID: 7613

Created: 08/06/2021 @ 4:40PM  
Last Updated: 08/06/2021 @ 4:40PM by System Processing

Edit Print Version Save as PDF

General Delivery/Funding Location Supporting Documents

**Bridge Information**

Title ARLINGTON RIDGE RD () over FOUR MILE RUN (105) - Replace Bridge		
Federal ID 105	Route	Facility Carried ARLINGTON RIDGE RD
District	Organization Arlington County	Featured Intersection FOUR MILE RUN
Bridge Project Point of Contact Name Todd Springer - dodo bird	Point of Contact Phone (111) 222-3333	Point of Contact Email ASDFASDF@ASDFs.com

**Draft SGR Scores**

View State of Good Repair (SGR) Bridge Scoring criteria: <https://www.virginiadot.org/projects/state-of-good-repair/bridges.asp>

# SMART Portal

## SGR Locality-Owned Bridge Applications

### General Pearl (mock example) – Edit Mode

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Editing


State of Good Repair Bridge 2023 Pre-Application


ARLINGTON RIDGE RD () over FOUR MILE RUN (105)


Project Status: Pending  
Organization: Arlington County  
Project ID: 7613


Created: 08/06/2021 @ 4:40PM  
Last Updated: 08/06/2021 @ 4:40PM by System Processing

[↩ View](#)

  
General

  
Delivery/Funding

  
Location

  
Supporting Documents

### Bridge Information

Title ARLINGTON RIDGE RD () over FOUR MILE RUN (105) - undefined		
Federal ID ⓘ 105	Route	Facility Carried ARLINGTON RIDGE RD
District Northern Virginia	Organization Arlington County	Featured Intersection FOUR MILE RUN
Bridge Project Point of Contact Name Todd Springer - dodo bird	Point of Contact Phone (111) 222-3333	Point of Contact Email ASDFASDF@ASDFs.com

### Draft SGR Scores

View State of Good Repair (SGR) Bridge Scoring criteria: <https://www.virginiadot.org/projects/state-of-good-repair/bridges.asp>

Importance Factor (IF): 0.533	Design Redundancy Factor (DRF): 0	Cost Effectiveness Factor (CEF): TBD
Condition Factor (CF): 0.37	Structure Capacity Factor (SCF): 0.038	Draft SGR Score: 0.256

# SMART Portal

## SGR Locality-Owned Bridge Applications


### General Pearl (mock example) – Inspection Report

Home New Application Dashboard About Todd-PMail Springer

Are the National Bridge Inspection Standards (NBIS) for the bridge up to date and submitted to your VDOT District office? (Generally, every 2 or less years for Structurally Deficient (SD) Bridges)

☒ Yes  
☐ No

Inspection frequency shall be in accordance with Section 650.311 (Inspection Frequency) of the National Bridge Inspection Standards 23 Code of Federal Regulations (CFR) 650 Subpart C. See the following link: <https://www.fhwa.dot.gov/bridge/nbis/t514021.cfm> See Q311-4 in the following link: <https://www.fhwa.dot.gov/bridge/nbis/#8>

Provide date of last inspection.  

Provide required inspection frequency.  Months

Home New Application Dashboard About Todd-PMail Springer

Are the National Bridge Inspection Standards (NBIS) for the bridge up to date and submitted to your VDOT District office? (Generally, every 2 or less years for Structurally Deficient (SD) Bridges)


☐ Yes  
☒ No

Inspection frequency shall be in accordance with Section 650.311 (Inspection Frequency) of the National Bridge Inspection Standards 23 Code of Federal Regulations (CFR) 650 Subpart C. See the following link: <https://www.fhwa.dot.gov/bridge/nbis/t514021.cfm> See Q311-4 in the following link: <https://www.fhwa.dot.gov/bridge/nbis/#8>

Locality is required to follow up with VDOT District Office to arrange for an up to date inspection report completed and submitted to VDOT District Office.

I agree with the above statement

☐ I agree  
☐ I do not agree

Provide date of last inspection.  

Provide required inspection frequency.  Months

# SMART Portal

## SGR Locality-Owned Bridge Applications

### General Pearl (mock example) – No Longer Poor (SD) Condition

- If bridge is no longer in poor condition (structurally deficient (SD)) then select “no” on radio button for this question.
- Applicant can quickly complete form.

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Todd-PMail Springer

### Draft SGR Scores

View State of Good Repair (SGR) Bridge Scoring criteria: <https://www.virginiadot.org/projects/state-of-good-repair/bridges.asp>

Importance Factor (IF): 0.533	Design Redundancy Factor (DRF): 0	Cost Effectiveness Factor (CEF): TBD
Condition Factor (CF): 0.37	Structure Capacity Factor (SCF): 0.038	Draft SGR Score: 0.256

Bridge Management Cost Estimate: ⓘ  
\$10,919,236

Are the National Bridge Inspection Standards (NBIS) for the bridge up to date and submitted to your VDOT District office? (Generally, every 2 or less years for Structurally Deficient (SD) Bridges)

☒ Yes  
☐ No

Inspection frequency shall be in accordance with Section 650.311 (Inspection Frequency) of the National Bridge Inspection Standards 23 Code of Federal Regulations (CFR) 650 Subpart C. See the following link: <https://www.fhwa.dot.gov/bridge/nbis/t514021.cfm> See Q311-4 in the following link: <https://www.fhwa.dot.gov/bridge/nbis/#8>

Provide date of last inspection.  
2018-03-14

Provide required inspection frequency.  
24 Months

Is this bridge currently Structurally Deficient (SD)?

☐ Yes  
☒ No

If the bridge was SD within the prior 24 months of the latest annual program update (July 1) and was replaced with an urgently required temporary bridge, then the bridge is still eligible to receive State of Good Repair (SGR) funding. See IIM-S&B-95 to be provided for further details. In such cases, check yes to this question, continue to complete the form, and submit note to this effect in the Detailed Project Description area later on in the form. After 24 months, a temporary bridge installed to eliminate the SD status will be considered to be a permanent bridge.

Save Application and Continue

Review Submission Readiness

Next

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# SMART Portal

## SGR Locality-Owned Bridge Applications

### General Pearl (mock example) – Requesting Funds

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Will you be requesting State of Good Repair (SGR) Funds and will the proposed scope permanently remove the Structurally Deficient (SD) designation? ⓘ

☒ Yes  
☐ No

Please ensure you have uploaded all of the required documents from the Supporting Documents section. View details of estimate requirements and conceptual level drawing requirements at the following link <https://www.virginiadot.org/projects/state-of-good-repair/bridges.asp>

Short Project Description

Rehabilitation - Deck Replacement \*

Detailed Project Description

Provide Explanation

# SMART Portal

## SGR Locality-Owned Bridge Applications

### General Pearl (mock example) – Requesting Funds

See

[Virginia Bridge Prioritization Formula](#)  
for details on [Smart Flags](#)

For Pre-Application, applicant should  
select what applies and discuss with  
district

Full Application requires  
documentation for use of Smart Flag

[Home](#) [New Application](#) [Dashboard](#) [About](#) Todd-PMail Springer

View detailed description and requirements of each Smart Flag : <https://www.virginiadot.org/projects/state-of-good-repair/bridges.asp>

Does the proposed structure qualify for any of the following Smart Flags? Select all that apply.

- ☐ Importance Factor-2 (IF-2): Bridge is the only access to a hospital, school, military base, police station, fire station, or critical government facility.
- ☐ Importance Factor-3 (IF-3): For Bridges with ADT < 100 and an acceptable detour exists, the DBE can request the Importance Factor be set to 0.
- ☐ Importance Factor-4 (IF-4): Bridge is on a Hurricane Evacuation Route as defined by the Virginia Department of Emergency Management. Also, Bridge is on a Primary Evacuation Route, once the routes are established per HB 1560 (2020 Session).

For information, please go to the Hurricane page on the VDEM website at the link below. Also, see the Hurricane Evacuation Guide on this web page for specific information on Hurricane Evacuation Routes. <https://www.vaemergency.gov/hurricanes/>

- ☐ Design Redundancy Factor-1 (DRF-1): A fracture critical element of a bridge that is in Poor condition.
- ☐ Design Redundancy Factor-2 (DRF-2): Bridge has a history of vehicular impacts due to low vertical clearance.
- ☐ Design Redundancy Factor-3 (DRF-3): Bridge is fracture critical and ADT is less than 1,000.
- ☐ Structure Capacity Factor-1 (SCF-1): Bridge requires posting and carries an Interstate or Primary road.
- ☐ Structure Capacity Factor-2 (SCF-2): A fracture critical element of a bridge that has significantly deficient vertical clearance
- ☐ Structure Capacity Factor-3 (SCF-3): Bridge has a history of accidents attributable to features of the bridge.
- ☐ Cost Effectiveness Factor-2 (CEF-2): Bridge currently has legacy Dedicated Bridge Funds and needs State of Good Repair funds to fully fund the project.
- ☐ Cost Effectiveness Factor-4 (CEF-4): The bridge project can be combined with other SGR funded bridge projects that will result in significant cost savings through reduced overall mobilization, MOT, or other synergies due to combining projects into one project. Bridges must be parallel/dual bridges, bridges that are part of a single interchange or bridges in immediate sequence no more than 1 mile apart.

[Save Application and Continue](#) [Next](#)

[Review Submission Readiness](#)

# SMART Portal

## SGR Locality-Owned Bridge Applications

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Todd-PMail Springer

### Editing State of Good Repair Bridge 2023 Pre-Application

ARLINGTON RIDGE RD ( ) over FOUR MILE RUN (105)

Project Status: Pending  
Organization: Arlington County  
Project ID: 7613

Created: 08/08/2021 @ 4:40PM  
Last Updated: 08/08/2021 @ 4:40PM by System Processing

[View](#)

General

Delivery/Funding

Location

Supporting Documents

### Phase Estimate and Schedule

Please provide project phase schedule and cost estimate information.
+ Add Project Phase

<b>Phase Milestone</b> PE (Survey, Environmental, Design)	<b>Status</b> Not Needed
<b>Phase Milestone</b> RW (Right of Way and Easement Acquisition, Utility Relocation)	<b>Status</b> Not Needed
<b>Phase Milestone</b> CN (Construction, Oversight, Contingencies)	<b>Status</b> Not Started

**Base Cost Estimate**  
\$ 12341

**Risks/Contingency**  
10%

**CEI**  
10%

**Start Date**  
2022-03-09

**End Date**  
2023-06-08

**Phase Estimate + Contingency + CEI + Inflation**  
\$15,930



# SMART Portal

## SGR Locality-Owned Bridge Applications

### Delivery/Funding Pearl (mock example) – Requesting Funds

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Phase Estimate and Schedule

Please provide project phase schedule and cost estimate information. ⓘ

Phase Milestone PE (Survey, Environmental, Design)	Status Not Needed	+ Add Project Phase
Phase Milestone RW (Right of Way and Easement Acquisition, Utility Relocation)	Status Not Needed	
Phase Milestone CN (Construction, Oversight, Contingencies)	Status Not Needed	

Description

Status ⓘ  
-- Choose Option --

Remove Project Phase

Description

Status ⓘ  
-- Choose Option --

Remove Project Phase

Description

Status ⓘ  
-- Choose Option --

Remove Project Phase

Total Cost Estimate ⓘ  
\$0

Status

Not Needed

-- Choose Option --

Not Needed

Not Started

Underway

Complete

Probably  
not  
needed

# SMART Portal

## SGR Locality-Owned Bridge Applications

### Delivery/Funding Pearl (mock example) – Requesting Funds

Fill in  
All required  
information

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### Phase Estimate and Schedule

Please provide project phase schedule and cost estimate information. [?](#)

Phase Milestone  
PE (Survey, Environmental, Design)

Status  
Complete

Base Cost Estimate  
\$ 0

Risks/Contingency/Unknowns  
-- Select Percent --

Start Date

Phase Milestone  
RW (Right of Way and Easement Acquisition, Utility Relocation)

Status  
Underway

Base Cost Estimate  
\$ 0

Risks/Contingency/Unknowns  
-- Select Percent --

Start Date

Phase Milestone  
CN (Construction, Oversight, Contingencies)

Status  
Not Started

Base Cost Estimate  
\$ 0

Risks/Contingency  
-- Select Percent --

Start Date

End Date

CEI  
10%

Total Cost Estimate  
\$0

# SMART Portal

## SGR Locality-Owned Bridge Applications

### Delivery/Funding Pearl (mock example) – Funding

Fill in  
All required  
information  
(if applicable)

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### Six Year Improvement Plan (SYIP) Allocations

#### SYIP Allocations

Provide Existing Project Universal Project Code (UPC) or Department of Rail and Public Transport (DRPT) ID if applicable

Add SYIP Allocations

Remove

Project UPC/DRPT/ID	UPC Description	VDOT / DRPT (\$)
11111	add description	\$ 1352

Total SYIP Allocations \$1,352

### Other Committed Funds

#### Other Committed Funds

Provide Information on Other Committed Funds if Applicable

Add Other Committed Funds

Remove

Other Funds Committed to Project	Description of Fund Type	Amount
Local /Regional Funding Not in SYIP	add description	\$ 2510

Total Other Committed Funds \$2,510

# SMART Portal

## SGR Locality-Owned Bridge Applications

### Delivery/Funding Pearl (mock example) – Funding

Home New Application Dashboard About

Todd-PMAIL Springer

### Funding Summary

Total State of Good Repair Funding Need

\$ 12067

Total Estimate  
\$0

Total SYIP  
\$1,352

Other Committed Funds  
\$2,510

Total State of Good Repair Fund Need  
\$12,067

Total Funds  
\$15,929

Insufficient funds proposed

Checks if they match

Provide Project Cost Estimate for Bridge replacement for use in calculating the Cost Effectiveness Factor (CEF). See State of Good Repair Bridge Scoring criteria for details:  
<https://www.virginiadot.org/projects/state-of-good-repair/bridges.asp>

Bridge Replacement Cost Estimate

\$

Bridge Replacement Cost Estimate must equal the Total Estimate

Previous Save Application and Continue Review Submission Readiness Next

**Also suggest submitting any  
Supplemental information  
That will helps reviewer**

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## State of Good Repair - Points of Contact

District	Technical Point of Contact District Bridge Engineer	Primary Point of Contact District Locality Liaison
Bristol	John Bechtold, P.E., PTOE 276-696-3365 <a href="mailto:John.Bechtold@vdot.virginia.gov">John.Bechtold@vdot.virginia.gov</a>	Matthew Cox 276-696-3281 <a href="mailto:Matthew.Cox@VDOT.Virginia.gov">Matthew.Cox@VDOT.Virginia.gov</a>
Salem	Dean Hackett, P.E. 540-387-5311 <a href="mailto:Dean.Hackett@VDOT.Virginia.gov">Dean.Hackett@VDOT.Virginia.gov</a>	Jay Guy 540-387-5247 <a href="mailto:james.guy@vdot.virginia.gov">james.guy@vdot.virginia.gov</a>
Lynchburg	Frank Lukanich, P.E. 434-856-8279 <a href="mailto:Frank.Lukanich@VDOT.Virginia.gov">Frank.Lukanich@VDOT.Virginia.gov</a>	Jay Brown 434-856-8246 <a href="mailto:Jay.Brown@VDOT.Virginia.gov">Jay.Brown@VDOT.Virginia.gov</a>
Richmond	Jeff Hill, P. E. 804-524-6139 <a href="mailto:Jeff.Hill@VDOT.Virginia.gov">Jeff.Hill@VDOT.Virginia.gov</a>	Larry Hagin 804-609-5329 <a href="mailto:larry.hagin@vdot.virginia.gov">larry.hagin@vdot.virginia.gov</a>
Hampton Roads	Fuller, Christine, P.E. 757-956-3203 <a href="mailto:Christine.Fuller@vdot.virginia.gov">Christine.Fuller@vdot.virginia.gov</a>  Ali, Mohamed, P.E. 757-956-3206 <a href="mailto:Mohamed.Ali@VDOT.Virginia.gov">Mohamed.Ali@VDOT.Virginia.gov</a>	Sonya Hallums-Ponton 757-925-2616 <a href="mailto:Sonya.Hallums-Ponton@VDOT.Virginia.gov">Sonya.Hallums-Ponton@VDOT.Virginia.gov</a>
Fredericksburg	Annette Adams, P.E. 540-372-3583 <a href="mailto:Annette.Adams@VDOT.Virginia.gov">Annette.Adams@VDOT.Virginia.gov</a>	Susan Gardner 540-899-4103 <a href="mailto:Susan.Gardner@VDOT.Virginia.gov">Susan.Gardner@VDOT.Virginia.gov</a>
Culpeper	Teresa Gothard, P.E. 540-829-7635 <a href="mailto:Teresa.Gothard@VDOT.Virginia.gov">Teresa.Gothard@VDOT.Virginia.gov</a>	Greg Banks 540-727-3380 <a href="mailto:Gregory.Banks@VDOT.Virginia.gov">Gregory.Banks@VDOT.Virginia.gov</a>
Staunton	Rex Pearce, P.E. 540-332-9104 <a href="mailto:Rex.Pearce@VDOT.Virginia.gov">Rex.Pearce@VDOT.Virginia.gov</a>	Michael Branscome 540-332-9057 <a href="mailto:Michael.Branscome@VDOT.Virginia.gov">Michael.Branscome@VDOT.Virginia.gov</a>
NOVA	Gary Runco, P.E. 703-259-3341 <a href="mailto:Gary.Runco@VDOT.Virginia.gov">Gary.Runco@VDOT.Virginia.gov</a>	Maria Sinner 703-259-2342 <a href="mailto:Maria.Sinner@VDOT.Virginia.gov">Maria.Sinner@VDOT.Virginia.gov</a>

## THANK YOU

If you have general questions or questions about the Bridge Prioritization formula or VDOT's Structure and Bridge Division information, you are encouraged to contact the following:

**C. Todd Springer, M.Sc., P.E.**

**Program Manager**

**Bridge Maintenance/Management Program Area**

**Structure & Bridge Division**

**[Todd.Springer@VDOT.Virginia.gov](mailto:Todd.Springer@VDOT.Virginia.gov)**

**Pone: 804-786-7537**

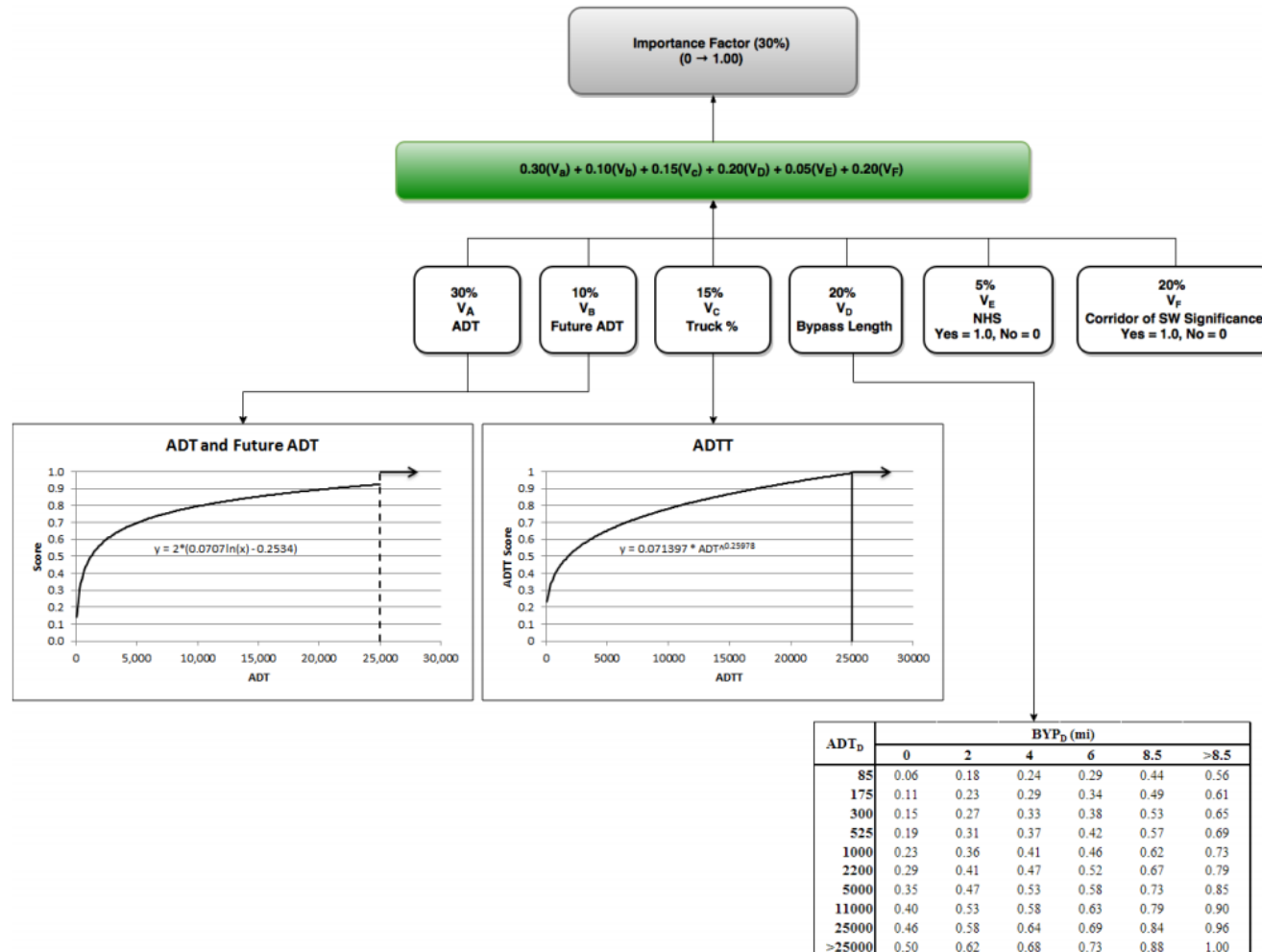
# BACK UP SLIDES



# Importance Factor (IF)

[http://www.virginiadot.org/vtrc/main/online\\_reports/pdf/16-r19.pdf](http://www.virginiadot.org/vtrc/main/online_reports/pdf/16-r19.pdf)

Figure 2 - Importance Factor



$$IF = 0.30(A) + 0.10(B) + 0.15(C) + 0.20(D) + 0.05(E) + 0.20(F)$$

Each of the sub factors below are unitless and vary from 0 to 1.00:

- A = ADT Factor
- B = Future ADT Factor
- C = Truck ADT%
- D = Bypass Impact Factor – *measures effects of detours*
- E = National Highway System (NHS)
- F = Corridor of Statewide Significance

## Condition Factor (CF)

$$CF = 1.0 - (\text{Health Index}/100)$$

- Health Index = Interim HI =  $100 - [100 * (9 - \text{B.GCR})^3 / (5.5^3)]$

Interim HI = 0 for B.GCR  $\leq$  3

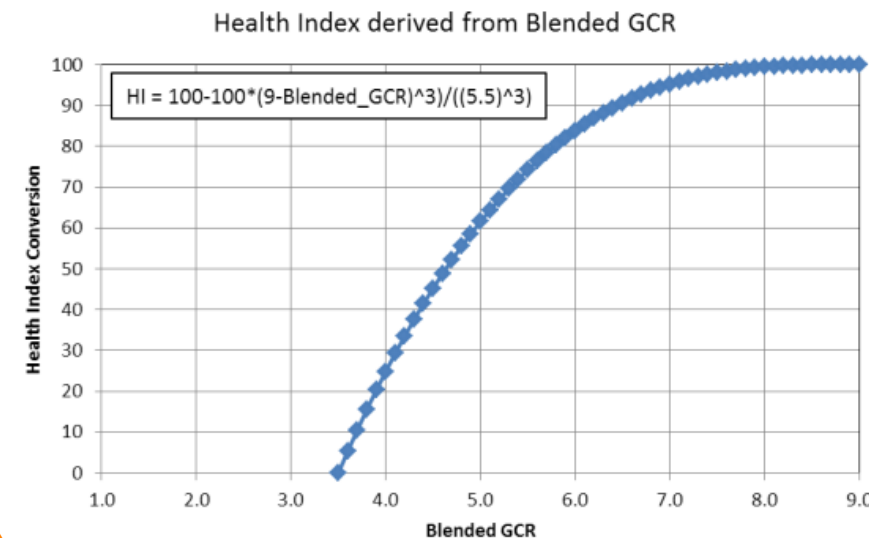
Interim HI = 100 for B.GCR  $\geq$  7

- Bridge: B.GCR = Blended General Condition Rating

$$= 0.25 * (\text{Deck GCR}) + 0.35(\text{Superstructure GCR}) + 0.40(\text{Substructure GCR})$$

- Culvert: B.GCR = 1.0(Culvert GCR)

Figure 7 - Blended GCR vs. Interim Health Index

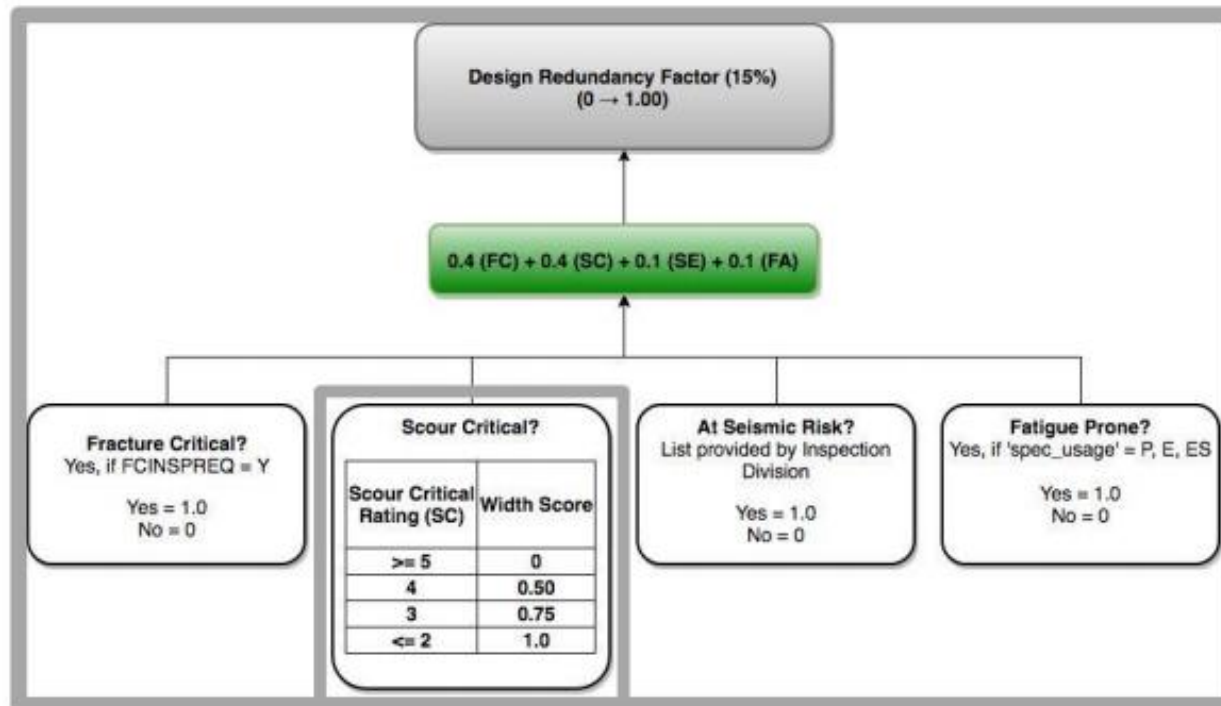


# Design Redundancy Factor (DRF) (Risk)

$$DRF = FC + SC + SE + FE$$

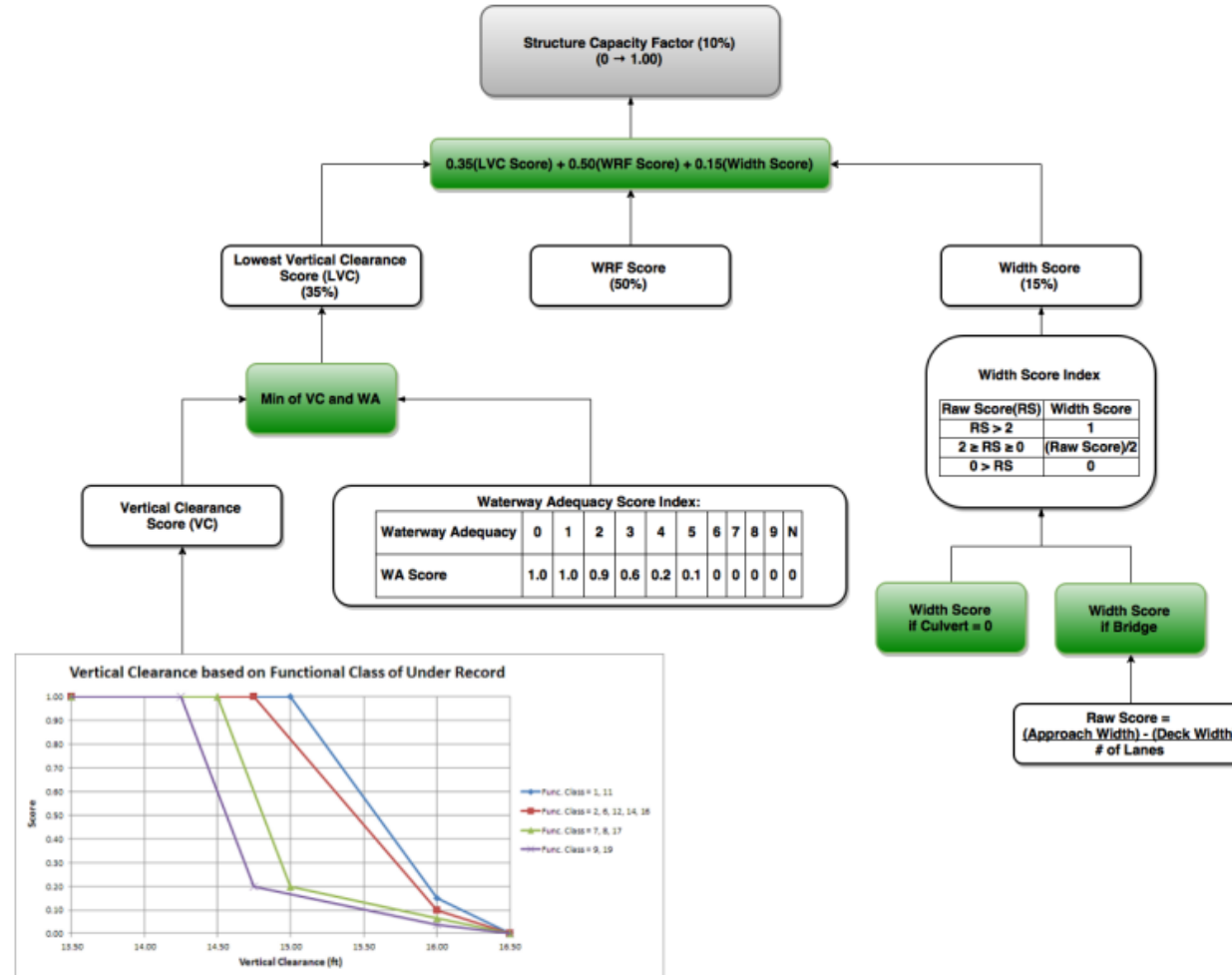
- FC = 0.40 if Fracture Critical
- SC = 0.40 if Scour Critical
- SE = 0.10 if Seismically vulnerable
- FE = 0.10 if Fatigue-prone details exist

Figure 8 - Design Redundancy Factor



# Structure Capacity Factor (SCF) (Functionality)

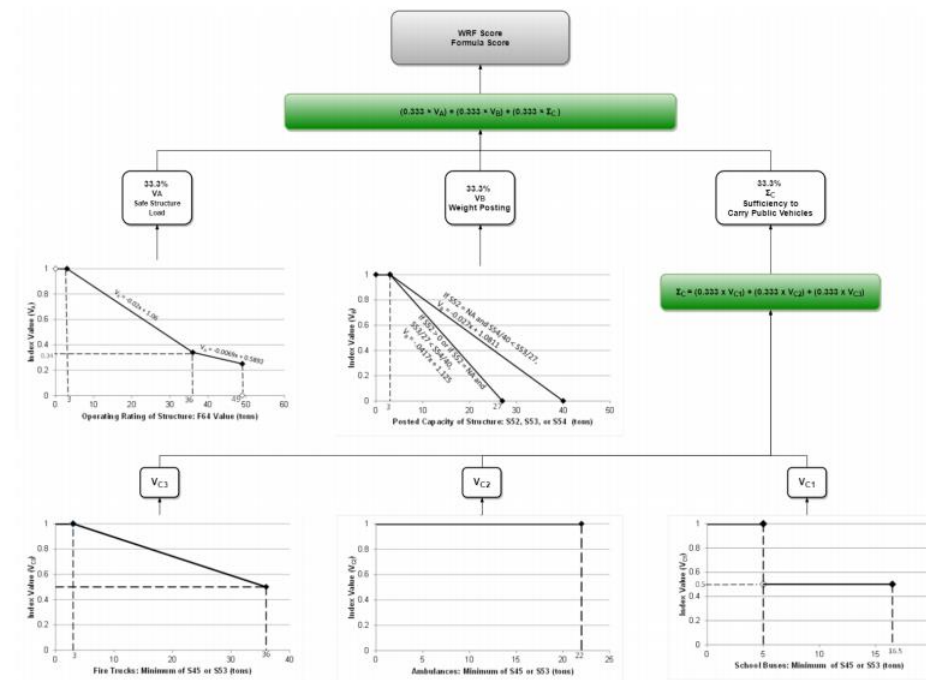
Figure 9 - Structure Capacity Factor



# Weight Restriction Factor

- Weight Reduction Factor (WRF) = 0 to 1.0 score measuring ability of structure to carry freight, fire trucks, ambulances, school buses and design vehicles
- For more detail on the development of the WRF factor see “The Weight Restriction Factor: A Composite Score to Quantify a Structure’s Current Load-Carrying Capacity in Commerce and Emergency Mobilization” – VTRC 16-R, April 2016.

Figure 10 - WRF Score



## Cost Effectiveness Factor (CEF)

Figure 11 – Cost-Effectiveness Score

